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AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

BY ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

(Continued from pages 307, 349, 382, 429, and 483.)

FINAL CONCLUSIONS AND SUGGESTIONS.

THE SOUTH-EAST, THE MISJUDGED.

In earlier papers, to the extent that they were discernible in available statistics, and revealed by the analyses of typical soils, I have dwelt in some detail on the conditions that at present characterise our three South-Eastern counties. There remains for this concluding article the task of summarising the position, and indicating in outline the course along which I deem future progress can with best advantage be directed.

In the character of owners and nominal occupiers of close on 600,000,000 acres of land we are, perhaps, not at all times inclined to appraise at their true value these 3½ million acres hidden away in an extreme corner of so vast a territory. That to climate and physical environment in general may be traced back important occult influences, which, so to speak, have the shaping and making of our minds, as well as our bodies, is undeniable; and not least among their direct effects is the light in which, by the inexorable logic of average results, they constrain us to look upon the agricultural possibilities of the country that surrounds us. Throughout South Australia our conceptions in such matters are by this very fact circumscribed to a horizon under which a scanty rainfall dominates all other factors. And so great in this direction is the power of conditions that normally surround us, that to judge adequately and justly of the requirements and hidden possibilities of an important tract of country, controlled by standards other than those with which we are familiar, involves an effort of mind against which, for the most part, human mental sluggishness rebels. To the average individual, for instance, three million acres in this favoured and well-watered district convey very little more than three million acres in any other portion of the State. The differences, nevertheless, are incalculable. And it was largely because I felt that our general attitude towards the South-East was frequently at fault that I originally resolved upon this present enquiry. If in the end it can bring to some a more just appreciation of an important area of the State that in present circumstances we no more than nominally occupy, and if in some slight measure it helps to stem an unfortunate spirit of emigration that in a new country is quite incomprehensible, I shall rest satisfied that some good has been achieved by it.

To imagine that the bulk or even a fair percentage of the soil in the three counties is of exceptional natural fertility would imply the commission of a serious error of judgment. A more correct conception of the position would probably represent the bulk of the land as from an agricultural standpoint comparatively poor, relieved here and there by limited tracts of exceptional fertility; but to infer therefrom that the agricultural occupation of

the land is likely to prove unprofitable, and that the present sheep-walk solitude is a natural and permanent feature of the landscape, would, in my opinion, constitute an error far more serious to the community than any over-estimate of its actual farming value. It is now a matter of history that with us agriculture has in the past tended much, to our cost, to overstep the northerly boundaries fixed by Nature, and in the scramble northwards, southerly lands of less promising outward appearance have too frequently been neglected. In palliation of our now historic error it may well be said that it is only recent times that have clearly defined to us the limitations of our climatic conditions, and with the turning of the tide we should bear in mind that, whilst there is no earthly influence that can appreciably modify local climate, the farmer who handles his soil with judgment has the making of it in his own hands.

PROBABLE EFFECTS OF THE EXTENSION OF FARMING IN THE SOUTH-EAST.

In the South-East we have an extensive area of country, endowed from the standpoint of general agriculture with many climatic advantages. According to districts, the average yearly rainfall varies from 25 to 35 inches, whilst the mean annual temperature is considerably below that which characterises the bulk of the South Australian farming area, thus conferring, by reduced evaporation, additional effectiveness upon an already heavy rainfall. For the most part, the general relief of the country is flat and even, and whilst the latter is not, of course, arable over every acre of land, it is so over by far the greater proportion of the area. And yet, all these advantages notwithstanding, from 1896 to 1903 not more than 1.78 per cent. of the area in nominally occupation was under cultivation, the remaining 98 per cent. being abandoned to sheep. What a change from depasturing sheep on the scanty natural herbage to general mixed farming would represent to the State I have already endeavoured to show in an earlier paper.* I pointed out at the time that during the past seven years the gross returns from the area under cultivation had averaged annually £283,000, or about £4 4s. 10d. per acre, whilst those from the depastured area had not exceeded £562,500, or, approximately, 3s. 4½d. per acre. Were we to assume that, instead of only 1.78 per cent. of the area in occupation, 50 per cent. of it was under cultivation, and that owing to the lesser natural fertility of much of the land at present depastured the average gross returns per acre of the cultivated area were reduced from £4 4s. 10d. to £3, instead of the sum of £283,500, the average gross returns from the cultivated area in the South-East would exceed £5,000,000 per annum. And when we further recollect that during latter years the total returns from both cultivated and depastured areas taken together have not averaged more than £846,000 annually, we shall begin to realise how much the State stands to gain by accelerating the progress of the plough in this district. From time to time we hear much of the transit requirements of the South-East; and, isolated as it is from the main centres of population, there is, no doubt, much to say in favour of extending the broad gauge line or of giving the district suitable harbour accommodation. But, after all, does not this savour a bit of anticipating events? Let a fair proportion of the wide area that is at present merely grazed be farmed, and what can at present only be put forward as a special favour it will then be possible to insist upon as an absolute and irresistible right.

FUTURE OF SOUTH-EAST AND THE STATE BOUND UP IN MORE INTENSIVE FARMING.

To assume that the mere breaking up of comparatively poor land, favoured with a good reliable rainfall, must necessarily lead to the outpouring of gross returns per unit of surface that are in present circumstances beyond the reach of many other districts would imply but the shallowest of glances beneath the surface of things. If the agriculture of this district is to be modelled upon the standards that at present characterise the bulk of our farming area, it is, perhaps, as well for the future of the South-East that it continue to support the roaming sheep until such time as the inexorable trend of economic conditions shall have compelled us to a better and more perfect utilisation of the soil. A marked rise in land values has been throughout the arable portion of the State a distinct feature of the last few years. It has not, however, been received with equal complacency on all sides. It has not infrequently been characterised as fictitious and temporary in char-

* Vide *Journal of Agriculture*, December, 1903, page 306.

acter, with the corollary that any further progress in this direction must inevitably tend to render the future exploitation of the soil more or less unprofitable. Such views, to my mind, argue in the holder one of two things. exceptional shortness of mental vision, or absolute want of faith in the natural conditions that surround us. They imply that the form of agriculture that we have practised in the past, and that is perfectly normal in a country recently opened up and occupied by a handful of people, must permanently characterise all future operations, and is susceptible of no further progress. Were such views to be admitted it is quite comprehensible that, whilst a ten-bushel or even a fifteen-bushel harvest gathered in once in two years, might return fairly profitable interest on land valued at £5 an acre, the reverse might be the case were the monetary value of the land to reach double the amount under pressure of increased demand of an expanding rural population. Personally I hold views diametrically opposite to those who imagine that, for better or for worse, our farming practice has reached a limit beyond which no further progress of any importance is likely to be realised. I hold—and I believe the proposition amounts almost to a truism—that in no part of this State does the monetary value of agricultural land represent anything approaching its actual value as an agent of production; and that in the course of time, gradually, if slowly, land values must continue to rise, with the inevitable consequence that those who find themselves incapable of accommodating themselves to altered circumstances, and of continuing to earn fair interest on the enhanced capital value of their land, will be elbowed out by those who can. It is idle to imagine that returns in excess of those that obtain at present can be secured without increased expenditure per unit of surface, and the same economic factors that will in the end compel us to look for greater gross returns will force us equally to the concentration on the land of a far larger working capital than at present characterises our ordinary practice. I am persuaded that ultimately such events must be felt throughout our agricultural country; but when the time comes nowhere will the transition from extensive to intensive farming be found easier than in the South-East, and it is to these three forgotten counties that we may look for the first forward step. The future development, therefore, of this portion of the State does not end with the arrival of the plough on the area at present depastured. It depends much upon the methods that are adopted by the new occupiers of the soil.

COMBINATION OF CROP-RAISING AND THE FEEDING OF LIVE STOCK.

From time to time the most varying of prognostics have been put forward as to the agricultural future of this South-Eastern country. It has in turn been extolled as an ideal dairying district, a first-class fruit district, a good wine district, etc. It cannot be denied that in many directions the local conditions offer special temptations towards specialisation in agriculture: and no doubt, in course of time, over various portions of the district, we shall see firmly and profitably seated the various specialised forms of general agriculture that are suited to them. Any discussion, however, that has reference to the general future of three million acres of untouched land must of a necessity look to mixed farming properly so called to absorb the bulk of the area. If, therefore, for the present I overlook these specialised forms of our rural industries, it is not because of any lack of sympathy with them, or because I undervalue their importance or suitability to local conditions, but because I am confident that they can never absorb more than the merest fraction of the available area, and that at all times they admit of association more or less close with what must form the preponderating form of occupation, viz., mixed farming.

If we look to the past, even over the limited area that has hitherto been cultivated we find marked evidences of a tendency to specialise along certain lines; nor, indeed, have the results been at all times satisfactory. Potatoes, for instance, have in certain portions of the South-East yielded remarkable results, and growers are not wanting who have pinned their faith to the tubers, wherever they could be made to grow. If we look to this crop as heading the rational rotation of a farm on which an adequate number of live stock are kept, there is no doubt much to be said in its favour; but if our implicit faith in the tubers implies equally implicit reliance on local markets for their disposal, we shall rarely escape discomfort and financial difficulties. Eloquent examples of this fact have not been wanting of late years. I humbly express the opinion that the more perfect utilisation of the land

pre-supposes in the first place the adoption of some definite form of rotation, so conceived as to raise the stock-carrying capacity of the district to a maximum. What, after all, is there to hinder the South-East from exporting proportionally as much frozen meat and dairy produce as New Zealand? The rearing and feeding of live stock on the land presents in this connection many advantages. It places saleable farm produce in a more concentrated form, reducing freight and handling to a minimum; in most cases it secures to the farmer higher value for the crops he raises than would have been realised by the sale of the raw material; and, finally, instead of leading to the progressive exhaustion of the land that always accompanies the practice of selling off the farm the whole produce raised upon it, the feeding of stock enhances the natural fertility of the soil, helps to maintain it in good heart, and leads ultimately to higher and more profitable crop yields.

THE ADVANTAGES OF THE ROTATION OF CROPS.

The feeding and rearing of a large number of live stock on the farm without the aid of a well-conceived system of rotation of crops is of course out of the question. One is the natural complement of the other; without rotation there can be but a very limited number of live stock on the farm; and without live stock to turn the crops into saleable produce there cannot possibly be any profitable form of rotation. Unquestionably, systematic rotation presents many other advantages beyond the mere feeding of stock, and that they have not been availed of in the past is not so much because of climatic difficulties as because of our pre-conceived ideas that stock cannot be profitably handled except they be grass or, rather, weed fed. I trust that I shall be excused for referring in detail to the advantages that generally accrue from the adoption of a rational system of rotation. If it is true that these advantages are known to many, it is equally true that they are unknown to an equal number, and in ordinary practice are availed of only by a distinguished minority. The sole object of the practice is frequently supposed to reside in periodical rest, which land under crop is assumed to need, either because available plant food is said to be exhausted by the repeated re-appearances on a given plot of land of the same crop, or because crops are supposed to leave in the land excreted substances injurious to their kind, but more or less beneficial to crops differing in character from them. The opinion, however, that any such theoretical views can have been in any way responsible for the adoption of the systematic rotations that characterise the practice of the most advanced agricultural communities of the world cannot, however, be seriously entertained. It is too well known that in most cases progress in agricultural practice has been adopted only under the stress of economic conditions. Theoretical explanations usually follow in the rear, pointing perhaps to improvements in what has already been adopted, but rarely if ever initiating. The same conditions that in times gone by have driven others from bare fallow and wheat to rational rotation are, in my view, forcing us in a similar direction to-day.

If, as is frequently supposed, it is merely a question of temporary soil exhaustion that leads to the adoption of crop rotation, the progress made in the latter half of the last century in the use of artificial manures readily points to an alternative remedy. By their means it is always possible to return to the soil quite as much as has been withdrawn from it by a crop sold in its entirety off the farm. The long and continuous experiments of Lawes and Gilbert, started in 1845 and continued ever since, embracing most farm crops in use, prove conclusively that with the judicious use of manures it is quite possible to raise year after year on the same plot of ground more than average yields of most farm crops. And, with the great exception of leguminous crops, wherever a failure has been experienced, as was the case with continuously grown turnips, the failure has been invariably traced back, not to soil exhaustion, nor to hurtful excretions from the roots, but to defective mechanical condition of the soil or subsoil, which could not be remedied under the identity of tillage operations that necessarily characterises the constant recurrence of similar crops. The failure of certain leguminous plants, such as red clover, or even beans, when grown year after year, or even at greater intervals of time on the same plot of ground, has not, however, received any satisfactory explanation. It is certain that when plants are liable to the attacks of specific parasites, whether vegetable or animal, they are more likely to suffer from them when the preceding crop was of the same kind and had offered a favourable medium to the disease for development. We have

instances of this fact in the South-East, with the potato blister; and with "takeall" in the lighter land of some of our wheat-growing districts. To what extent this liability to infection from a preceding crop may serve to account for what is known in Britain as "clover sickness," or the inability of the plant to thrive on the same ground except at intervals of eight and twelve years, it is somewhat difficult to determine. All that can be said is that such an explanation was not accepted as adequate by Lawes & Gilbert, and the red clover and other leguminous plants still stand out in this connection as unexplained anomalies.

ROTATION OF CROPS PREPARES THE WAY FOR THE WHEAT CROP.

Briefly stated, therefore, it is not necessary to seek for a justification of rotation in either the exhaustion of the soil or hurtful excretions of the roots; the practice has commended itself to those who have adopted it, because when rationally conceived it leads to the best possible utilisation of the soil. And when we find ourselves driven to a similar practice we cannot expect from it results at all commensurate with those of other countries, unless we realise clearly in what the most profitable utilisation of the land consists under our conditions, and set about determinedly to make it our own. If I have said that I hold the opinion that the stock-carrying capacity of our farms should be raised to a maximum, I am very far from imagining that any more in the South-East than in the rest of the State *wheat* is, within our times at all events, destined to be displaced as the foundation of our farming. After all, it is not even necessary to sell wheat when prices are unfavourable; it is always possible, when live stock are available, to feed it to better advantage. I am prepared, however, to recognise that in the majority of cases the bulk of the wheat raised will be sold, for the simple reason that when grain is required for feeding purposes both barley and oats will generally supply it at terms more profitable to the grower. Inferior grain may, however, always be availed of in this direction, and it is probable that the more general adoption of the feeding of stock will do much in an indirect way towards the improvement of our average sample of marketable wheat. For a period of time, beyond which we have little interest in extending our enquiry, wheat must continue the principal crop and mainstay of the average farm, and any system of rotation that does not take this fact into consideration, and is not so conceived as to form the best possible preparation for the closing wheat crop, must be looked upon as more or less defective. A good type of rotation must inevitably reduce somewhat the proportional area at present under wheat; but it by no means follows that it must have a similar effect on the quantity of wheat exported or placed on local markets. By leading to a notable increase in the average yield per acre it is quite possible that the action of rotation in this direction may have quite the reverse effect.

REQUIREMENTS OF THE WHEAT CROP.

Let us review briefly the combination of circumstances that, independently of the nature of the soil and weather conditions, leads to heavy yields in wheat. Immediately preceding the latter cereal there are only three alternatives that can be admitted:—(1) Bare fallow; (2) a hoed crop; (3) a smothering crop. Bare fallow we must exclude, as being possible only so long as the price of land is sufficiently low to admit of the realisation of profitable returns from one harvest in two, or even three, years. This is the era of large areas and small yields, out of which, I imagine, we are slowly emerging. The remaining alternatives I shall have occasion to examine later on. Both aim at clean land, without which it is impossible to rely upon heavy average yields. In addition to these conditions affecting the season immediately preceding the wheat crop, heavy yields are obtainable only from soil that is in good heart and sufficiently rich in available plant food. Over abundance of the latter, particularly in the nitrogenous form, leads to rank straw growth, and not infrequently to the laying of the crops, when unfavorable weather conditions prevail, and not invariably to heavy yields. The absence of a hard plough pan in proximity to the surface, which often hinders the root development of a plant that is far deeper rooted than is usually imagined, contributes equally to heavy yields, particularly in dry seasons. The destruction of this pan can only be secured by the varying forms of tillage that are dictated by the special requirements of the crops that precede the wheat crop. Finally, tillage operations leading up to the wheat crop must be more or less shallow, with a view

to the preparation of a good but shallow tilth, seated upon a firm but not impenetrable bottom.

A MODEL FOR LOCAL ROTATIONS.

In the absence of any local experiments extending over a sufficient period of time, I am loth to put forward what constitutes, after all, merely a personal opinion, however strongly held, as to the form of rotation best likely to meet the requirements of the district. After all, it is not merely the question of the adaptability to soil and climate of the crops that might be suggested that has to be taken into consideration. Equally important, if not more so, are the conditions that render their cultivation economically possible, including their ultimate disposal on the markets or their utilisation as food for live stock. I am thrown back, therefore, upon practices that I know to be successful elsewhere, and in my endeavour to accommodate them to local conditions I must crave indulgence for unavoidable errors into which I may possibly be led.

I know of no form of rotation more rationally conceived, and, in my humble opinion, no model on which we can to better advantage build our own rotations than what has acquired worldwide renown, under the name of the *Norfolk four course rotation*. In its most typical form this rotation is represented by the following crops:—

First year	...	...	...	...	...	...	...	...	Turnips.
Second year	...	...	...	...	...	...	...	...	Barley
Third year	...	...	...	...	...	...	...	...	Red clover.
Fourth year	...	...	...	...	...	...	...	...	Wheat

In every sense this succession of crops may be said to represent almost ideal preparation for wheat, which closes the course; and in practice, besides utilising the land to best possible advantage in the years that precede the wheat crop, it has in the fourth year led to exceptionally heavy wheat crops, which could not in ordinary circumstances be obtained otherwise. The course opens with a root crop, benefiting both from direct deep tillage and heavy dressings of farmyard manure; this crop, in fact, representing one quarter of the area under cultivation on the farm, should receive the bulk of the farmyard manure. The beneficial effects of the comparatively deep tillage and the slowly decomposing manure are felt by all succeeding crops of the course, not excepting wheat. Placed too close to the latter crop, under our conditions at all events, both would probably prove more injurious than beneficial. For the latter reason, too, it is probable that barley will follow the root crop more advantageously than wheat. The interposition between the two cereals—barley and wheat—both of which have a tendency to dirty the land, of on the one hand a hoed crop, such as turnips, and on the other a smothering crop, such as red clover, prevents the land from becoming foul with weed growth. Finally, a leguminous crop, such as clover, with its deep roots and power of accumulating atmospheric nitrogen in the soil, always precedes wheat with advantage, providing the latter as it does with the means of making strong, vigorous growth.

SUGGESTED ROTATIONS.

It is not likely that the Norfolk rotation could be adopted here with advantage without some modification; nor have I put it forward under any such impression. The spirit of it, however, I believe, should preside over the practices we may find advantage in adopting. In the light merely of possible alternatives I suggest the following arrangements:—

First year	...	...	...	Turnips, or swedes, mangels, potatoes, kale.
Second year	...	...	...	Barley, or oats.
Third year	...	...	...	Red clover, or beans, pease.
Fourth year	...	...	...	Wheat.

In the above arrangement I should assume that the root crops would generally be fed on the farm, with the exception, however, of potatoes, which would be sold whenever the markets were not against them; that the greater part of both the barley and the leguminous crop would be similarly treated: whilst the wheat, with the exception of defective grain, would generally be sold. It follows that such a rotation is only possible conditionally on a number of stock corresponding to the crops to be fed being kept on the farm.

In addition to the above main crops, representing the staple production of the farm, catch crops of various kinds, such as rape, crimson clover, vetches,

etc., can from time to time be sown down, and fed or ploughed in, according as opportunities arose.

I do not forget that it would be contrary to custom, and, perhaps, in the circumstances, distinctly bad policy, to include the whole of the arable area of the farm in the cycle of crop rotation. There is distinct advantage, whenever circumstances permit, in periodically putting down a portion of the land to grass, that for a period of years forms what can be called permanent pasture. At regular intervals this grazing area can be broken up and made to enter again into the ordinary farm rotation, whilst new fields, previously under crop would, for a while, take its place. It may be added, too, that much to the advantage of succeeding crops, whenever circumstances permit of it, lucerne will advantageously replace the whole or portion of the area under sown grasses. What proportion this grazing area should bear to the area under immediate cultivation is a matter depending too much upon individual conditions to render advisable any general recommendations on the subject.

ROTATION AT NO TIME A HARD-AND-FAST RULE.

It would be an error to suppose that the farmer who adopted any special form of rotation was bound to it hand and foot. The profitable disposal of farm produce is largely dependent on the conditions of the market, and it is in accordance with the demands that the farmer is obliged to regulate his offers. What has been found profitable in one season there may not infrequently be advantage in replacing by something else in another. Such matters come mainly within the range of personal judgment, and whilst it is possible to treat of the subject in a general way, the details of practical application must necessarily be left to the decision of the individual. It is unquestionable, however, that the feeding of stock on the farm, and the possibility of exporting available produce to other countries, undoubtedly confers upon the farmer greater independence of the markets. Assume, for instance, that potatoes are grown mainly for the Adelaide market, and that in the ordinary course of events pigs are fattened on grain. In years when the tubers are hardly worth lifting, if the stock are available the former can be fed to them, and the grain stored or sold, according to circumstances. Nor does the adoption in a general way of an admittedly satisfactory succession of main crops interfere with the occasional growing of special crops, such as onions, chicory, flax, hops, etc., should any of the latter at any time appear to promise profitable returns. Portion of the area usually allotted to one of the main crops can at any time readily be reserved to what appears likely to prove more profitable.

PLEA FOR EXPERIMENTAL WORK.

I am well aware that whatever I may have put forward as to the advantages of crop rotation, and the association of live stock with the growing of crops, remains incomplete without some indication as to the number of stock that would correspond to a farm of average dimensions conducted on the lines that I have suggested, and the average net as well as gross returns that might be expected therefrom. I could readily put forward tentative figures, based on what obtains in other countries. This, however, I do not care to do, and again I have occasion to regret the complete absence of local experimental work that might lead to a general solution of this problem. The need of carefully conducted work connected with our numerous agricultural problems has been evident to me for many years past: and it has been brought home to me with special force since I have been entrusted with the direction of the Department of Agriculture. On various occasions I have drawn attention to this important question, but hitherto without practical effect. Perhaps what I have had to say on the matter here may awaken those interested in the progress of our rural industries to the incalculable importance of this question, and induce them to lend me a helping hand towards getting established a CENTRAL AGRICULTURAL EXPERIMENT STATION, from which all such work could be well and efficiently conducted. It is gratefully and with pleasure that I recognise here that the Hon. G. Brookman, M.L.C., has agreed to set aside a portion of his farm with a view to testing some of the points I have here raised. The next step is the appointment to the Department of an agricultural chemist, without whose help much of the work must lose its value and remain more or less ineffective.

DO ECONOMIC CONDITIONS OPPOSE ROTATION AND THE FEEDING OF LIVE STOCK?

Whilst in present circumstances I recognise my inability to adequately discuss the financial position of a farm on which much of the produce raised is fed to live stock, I am anxious to draw attention to one aspect of the question which, in my opinion, is frequently misrepresented. Because in the conditions under which live stock are usually reared and fattened in Australia the labour bill is reduced to so low a minimum as to become almost a vanishing point, it is generally assumed, openly or tacitly, that the additional labour that attaches to what is termed "hand feeding" is doomed to remove what profits might otherwise derive from the operation. Such an objection appears to me almost childish in its simplicity, and if the margin of profit be so negligible a quantity what possible interest can we have in wresting vast areas of land from occasional sheep and still rarer human beings? In every agricultural district, when the harvest is ripe, arises the cry that the supply of labour is insufficient; in the daily press and elsewhere is constantly re-echoed the cry that population is accumulating in the cities whilst the country remains more or less deserted; and yet what have we done towards forming an efficient rural contingent of labour capable of aiding the occupiers of the soil in turning it to best advantage? For how many permanent hands, besides the members of his family, does the owner of a farm of average dimensions find occupation? And, in the circumstances, how can it be expected that efficient labourers will be prepared to sit down for the greater portion of the year in patient expectation of employment that can only extend over two or three months of the year?

Very far from being an insuperable difficulty in the way of the practice, I take it that the rural labour question will very largely find its solution in the more general association of live stock with general farming. The area sown down to one crop will be reduced considerably, and the feverish activity of the seeding and harvest months, followed by prolonged periods of comparative somnolence, will be replaced by the regularity that characterises the better distribution of farm operations throughout the year. True, the number of permanent farm hands will need to be considerably augmented; but, given adequate returns from their labour, is not that a contingency to be desired rather than feared? To refer to but one example, it might readily be proved by elaborate figures that to pull and stack mangels is a more or less unprofitable operation here. When it is considered, however, that the land that carries the mangels is needed without delay for another crop; that the latter ripen when other farm work is more or less slack; can it be said that an operation taken by itself is unremunerative because it finds employment for permanent hands who might otherwise be killing time in a manner far less useful? It is not by placing under the microscope one or two operations that the profitableness or unprofitableness of a rational rotation of crops, combined with the feeding of stock, can be determined, but by the careful examination of a series of balance sheets, corresponding to such operations, and extending over a sufficiently long period of years. It is with some such work that I would like to be associated in connection with experimental work. Of its ultimate value to the State I entertain not the shadow of a doubt.

I take it that the dear labour question, if not at times a mere pretence, is at all events a bogie we appear to have set up for our own special edification, and the harmlessness of which we have quite forgotten. Of far greater importance in this connection is the general lack of available working capital that characterises the average agriculturist. He has quite enough to work his land on existing lines, but to command the capital to force from it higher returns, higher interest, is generally beyond his power. It is this lack of capital, and not high-priced labour, that is likely to prove the greatest hindrance in the way of the rapid extension of the principles I have advocated. There is no doubt, for instance, that to adequately stock on the lines proposed, even only a 500-acre farm, involves the locking-up of a considerable amount of capital, in circumstances involving even greater risks than those represented by the comparatively cheap standing crops. As an alternative, of course, flock or herd admit of slow and progressive building up. When, however, in the meanwhile they must pay their way by periodical sales, the process is painful and long deferred. Paddocks, moreover, must be subdivided, fences improved, adequate provision made for water supply and the sheltering and feeding of stock, and, in brief, the business has to be learnt; all of which absorbs money. It might be added, however, that there

are numerous instances in which landholders might realise the necessary capital without much difficulty. Without a doubt many of our present holdings—I refer to those under cultivation, not those merely depastured—are far too extensive in area to ever admit of adequate intensive farming by their present owners. The inference is obvious. When the latter are convinced of the profitableness of the practices I have endeavoured to outline they may find the capital necessary to give effect to their belief in the sale of portion of their estates they are unable to utilise. That such a change would be fraught with advantage to the individual owners, I have little doubt; but it is unquestionably the State that must reap the fullest benefit from a process that must lead to the gradual peopling of our now more or less deserted rural districts.

CONDITION OF THE DEPASTURED AREA.

Thus far I have dealt with questions that I trust may at an early date find their application over the bulk of the arable land of the South-East, whether that land be at present under cultivation or merely lying idle in patient expectancy of better times; indeed, I hold that the principles I have advocated, modified to the extent that environment appears to dictate, must eventually guide the practice of the greater portion of the legitimate farming area of the State. I propose, by way of conclusion, to summarise what appear to me to be the special requirements from the point of view of general agriculture of that vast depastured area that sooner or later must come under the influence of tillage. The limitations that result from local climate need no further reference. With slight and inevitable variations they remain substantially the same as those obtaining over the area at present under cultivation. The limitations imposed by varying soil fertility, under almost identical conditions of climate, are otherwise important, and it is to them that we should turn our attention. Whatever has been said or may in the future be said of the matter, I am absolutely certain that, given a thorough knowledge of climatic and other local conditions, a correct interpretation of soil analyses affords an infallible index to the natural fertility of virgin land. It enables the interpreter to state without hesitation that the soil under examination is naturally fertile or more or less poverty-stricken. I must repeat, however, what I have on various occasions drawn attention to in the course of these articles: that the productivity of land is probably dependent to a greater extent on the treatment it receives than on its natural inherent fertility. Heavy yields are unquestionably obtainable with greater ease on soils of great natural fertility, but they are nevertheless not beyond the reach of those whose lot has been cast upon less promising material. It is a matter of almost universal experience, it has been noted in England during the latter half of the last century, it has been noted here since the general adoption of phosphates in connection with wheat-growing, that improvements in agricultural practice raise the monetary value of comparatively poor soils, whilst they are more or less without influence on that of the naturally fertile soils. If, therefore, we admit—and, indeed, I believe we cannot do otherwise—that, with a few possible exceptions, the bulk of the South-Eastern country that awaits cultivation is of considerably less natural fertility than the limited area hitherto cultivated, we by no means imply that net returns approaching those at present yielded by the cultivated area will be denied to the less fertile country awaiting cultivation. The value per acre, and consequently the rent per acre, must always be in proportion to the net returns obtainable, and heavy yields realised at lesser cost are always compensated by the burden of heavier rental, or interest on capital account.

I am bound to confess that our means of judging of the fertility of the vast uncultivated area, with its inevitable variations in soil, are confined to a quite inadequate number of analyses, some of which have already been given in the course of these papers. I cannot, however, avoid making what legitimate use I can of the material at my disposal, and I am inclined to the belief that, taken as a general review of the country, my conclusions are not likely to be much at fault. It should not be forgotten, however, that, whilst in such cases it is permissible to argue from the particular to the general, the reverse form of argument is eminently unsafe. Individual cases require individual examination and interpretation, and can by no means be guided by what is assumed to represent the truth for average local conditions.

In Table XIX. I have summarised some analytical data having reference to untilled portions of the South-East. To bring out clearly their special

defects I have set beside them similar data corresponding on the one hand to a good average soil taken as type, and on the other to the rich Mount Gambier loam.

TABLE XIX.

Showing Proportions of Fertilising Substances in Some Untilled South-Eastern Soils, expressed as pounds per acre of 3,250,000 lb. weight per foot deep.

Soils.	Total Nitrogen.	Total Phosphoric Acid.	Potash in Strong Acid.	Lime in Weak Acid.
	lbs.	lbs.	lbs.	lbs.
Standard good average soil (type)	3,250	3,250	6,500	162,500
Rich Mount Gambier black loam	9,377	5,558	6,289	12,627
Poor Mount Gambier soil	3,283	1,170	19,240	4,833
Light fern land	1,463	325	618	2,275
Kingston soil	6,533	1,170	19,240	4,833
Defective South-Eastern soil	3,029	1,623	4,151	3,588
" " " "	4,023	1,155	8,321	9,608

An examination of Table XIX. serves to show that, whilst the South-Eastern soils are probably on the whole sufficiently rich in nitrogen and potash, they are generally deficient in both phosphoric acid and lime. To this fact may be attributed the frequent luxuriance of the natural herbage, accompanied by apparent unpalatableness and poor feeding quality that has frequently been noted. It seems probable, therefore, that when the land comes under cultivation, regularly heavy yields will only be obtainable by the aid of phosphatic dressings, to which, in many cases, it will probably be found necessary to add liming in some form or other. It is not certain that the superphosphates that have given such satisfactory results in the drier northerly districts will prove of equal advantage in the moister and cooler South-East. Whenever lime is deficient basic slag will probably yield more satisfactory results; perhaps, too, bonedust, if obtainable at reasonable rates, should prove of advantage; and finally, even finely ground, untreated phosphatic rock may in certain circumstances be recommended.

I look to the root crops as having a great future before them in this district. For the latter, it is probable that potash manures may do much, accompanied occasionally by dressings of nitrates.

The poor fern land, of which there are, unfortunately, somewhat extensive areas, calls for special comment. This land is light in texture, and to a large extent seriously deficient in the requisites of plant life. At best but a few defective crops can be expected from it in the early years of its cultivation. Similar lands, however, have in other countries—in some portions of Silesia, for instance—been rendered fairly productive. For the purpose, recourse has been had to certain leguminous crops, notably lupins, which, when in full bloom, are ploughed in as green manure. These plants require generally dressings of phosphatic, or even potash, manures, which, when ploughed in, they leave in the soil at the disposal of future crops. Nitrogen they take from the air and store in the soil in quantities that could not otherwise be supplied, except at considerable and unwarranted expense. This practice of green manuring can safely be recommended for the light fern lands. Experience will soon show to what extent it will be followed by remunerative crops. In their present condition these light lands are practically valueless and it is certainly worth putting to the test a practice that has in other lands converted barren wastes into periodically fertile fields.

And thus comes to a conclusion my enquiry into South-Eastern questions. It has taught me much, and has afforded me the opportunity of putting on record personal views that years of observation have only served to strengthen. I trust that it will not be without its usefulness to those for whom it was specially undertaken.

ROSEWORTHY AGRICULTURAL COLLEGE EXPERIMENTAL FARM.

The Hon. Minister of Agriculture has received the following statement of accounts of the Roseworthy Agricultural College for the agricultural year closing on March 31 last :—

I append herewith statement of the Roseworthy Agricultural College Farm accounts for the season 1903-4. Referring back to my review of the situation some twelve months ago,* I find that I then expressed the anticipation that, in view of the exceptionally favourable season with which Roseworthy had been favoured, the financial results now under review would have been even more favourable than those attained in 1901-02, our previous best record. An inspection of the figures below will show that, unfortunately, my prediction has not been realised; in fact, the profit balance for 1903-04 is below that of 1902-03, an agricultural season in every respect inferior to it. I shall endeavour, in the course of this review, to unravel the causes of this apparent anomaly.

BALANCE SHEET.

The balance sheet, which is given below, sets out the position so far as it concerns our liabilities and realisable assets. The liabilities are small, and represent a few accounts in the course of settlement. The assets call for further comment.

These assets consist first of various forms of live stock that are separately enumerated. There are 30 horses, set down at various prices, but averaging, on Professor Towar's valuation, £13 18s. 8d. each; 14 dairy cows, averaging £8 12s. 2d. each; eighteen young heifers and calves, £4 4s. 2d. each; and 2 bulls, £5 each; 129 pigs, of various ages, averaging £1 17s.; and 498 sheep, of various ages, averaging £1 0s. 11d. On an examination of the details of the above valuation I am inclined to think that on both dairy cows and pigs too high a value has been set; in some instances, too, the sheep appear to have been over-valued. A comparison with the preceding year's numbers shows that horses and cows have remained stationary whilst pigs have increased slightly, and sheep to a considerable degree. No fault can be found with the policy of increasing the number of live stock on the farm, for it is certain that in South Australian agriculture at all events the practice of estimating the stock-carrying capacity of land by the number that can eke an existence out of the natural herbage and weeds during the worst months of the year must rapidly give way before the more rational practice of accepting as a standard the feeding value of forage crops raised for their benefit. At the same time, it is questionable whether some of the additions, particularly amongst the ewes, can be looked upon in the light of very desirable acquisitions.

In the implements, amongst new purchases are included a binder, a plough, a set of harrows, two seed graders, and a weeder. On implements previously in use the usual 10 per cent. depreciation has been taken into consideration. Some additions have been made, too, to the blacksmith's shop, tools, and harness.

Of produce in hand, represented by hay, straw, wheat, and various seeds, we have a total value represented by £1,113 17s. It is regrettable that so much produce should have been carried forward into the new year without any apparent attempt to realise on it when markets were more favourable than has since been the case. Particularly is this the case with wheat, that has suffered considerably in the barn from depredations of mice, involving considerable trouble in cleaning and actual loss in quantity. With reference to the disposal of hay a favourable opportunity did not, perhaps, present itself. Portion, of course, of the produce in hand must go towards feeding the various live stock, particularly in a season such as the present one, in which feed is late and scanty.

New fences and the water service are assessed at their cost, 10 per cent. being allowed each year for depreciation.

The amount set down as debts receivable—£654 0s. 5d.—may appear somewhat considerable. The chief debtor, however, is the College, and its in-

* *Journal of Agriculture*, September, 1903.

debtcdness is a gradual growth extending right back to 1899-1900. The sums due by the College to the Farm represent for the most part dairy produce, vegetables, meat, &c., supplied to the boarding-house, and which the sum voted yearly by Parliament for provisions, &c., has always proved inadequate to cover. The sums due in each year are indicated below:—

1899-00	...	...	...	...	...	£53	11	5
1900-01	...	...	...	...	...	28	14	4
1901-02	...	...	...	...	...	113	2	11
1902-03	...	...	...	...	...	148	15	6
1903-04	...	...	...	...	...	174	5	10

Total owing March 31, 1904£518 10 0

It is easy enough to say that such amounts might be written off each year. Consideration, however, must be given to the fact that the exigencies of a boarding-house and the curriculum impose upon the farm the unprofitable necessity of maintaining a dairy herd in a district notoriously unfit for the purpose, and of paying the wages of a gardener, whose sole duties consist in growing vegetables for the institution and keeping the grounds in order. Neither would be undertaken in other circumstances, and it would be manifestly unfair not to credit the farm with what little revenues it is entitled from such sources. In any case, as tending to simplify matters, I would respectfully suggest that the vegetable garden and grounds be no longer considered a portion of the farm, and that, to meet this alteration, a sum be provided on the Estimates to cover the wages of a gardener, whose sole duties have reference to the College and not to the farm. In the altered circumstances it would be no longer necessary to credit the farm with the value of vegetables raised for the boarding-house.

Balance Sheet, March 31, 1904.

Liabilities.			Assets.		
	£	s. d.		£	s. d.
Debts payable	...	114 16 7	Valuation—		
Balance (capital)	...	6,042 19 6	Live Stock—	£	s. d.
			Horses	...	418 0 0
			Cattle	...	206 5 0
			Pigs	...	238 5 0
			Sheep	...	520 13 0
				1,383	3 0
			Implements	...	956 13 8
			Sundries—		
			Dairy	...	20 7 3
			Blacksmith's		
			shop	...	127 2 8
			Miscell'n's	...	207 12 0
				364	1 11
			Bags	...	6 9 7
			Harness	...	82 13 0
			Manure	...	86 19 0
			Produce—		
			Hay	...	471 15 0
			Straw	...	92 0 0
			Wheat	...	431 18 6
			Seeds, vari-		
			ous	...	118 3 6
				1,113	17 0
			Fencing—		
			Erected	...	226 14 3
			Material	...	25 18 0
				252	12 3
			Water service—		
			Reticulations	...	108 18 8
			Debts receivable	...	654 0 5
			Deposit account	...	1,148 7 7
				1,148	7 7
				£6,157	16 1
				£6,157	16 1

PROFIT AND LOSS STATEMENT.

In the account below is shown what correctly represents the gross profit on the past year's transactions. It represents the difference between the net capital on March 31, 1903, and the net capital on March 31, 1904. The net capital consists of money in hand, value of stock and plant, as set out in the inventory and debts receivable, less debts payable. This gross profit is represented by £372 0s. 9d., and is considerably below what might have been anticipated after an exceptionally favourable agricultural season. During past seasons the gross profits have been as follows:—

March 31, 1900	...	...	...	...	...	£778	19	10
March 31, 1901	...	...	...	...	...	317	4	8
March 31, 1902	...	...	...	...	...	1,321	13	6
March 31, 1903	...	...	...	...	...	443	7	6
March 31, 1904	...	...	...	...	...	372	0	9

It is only fair to point out, however, that until 1903 the salaries of farm foreman and blacksmith were not paid out of farm revenue, but out of a vote provided on the Estimates; and that since November last the salary of a gardener at £80 per annum has been provided for out of farm revenue. These facts, however, offer no satisfactory explanation of the fact that the profit in 1904, after an exceptionally good season, is below that of 1903, after a notoriously bad season.

To arrive at the net profit, or the interest earned by net capital involved, we have to deduct a fair rental for the land. The present area of the College Farm is represented by 1,405 acres, which, at 4s. an acre, would yield an annual rental of £281, and leave a net profit of only £91 0s. 9d., or not quite 15½d. per acre. I may point out, by way of contrast, that the net profit per acre was 13s. 5d. in 1901-02, and 2s. 0½d. in 1902-3. In such circumstances, whatever the advantages of the season may have been, the transactions of the past year can hardly be looked upon as satisfactory from a business point of view.

In justice to whomsoever it may fall to take up the burden of the farm, there is a further point to which attention should be drawn. In closing Treasury accounts at the end of each financial year it has been the practice to transfer to revenue the whole of the available cash balance to the credit of the college farm deposit account. The following sums have been transferred during past financial years:—

June 30, 1900	...	...	...	...	...	£44	1	6
June 30, 1901	...	...	...	...	...	132	5	6
June 30, 1902	...	...	...	...	...	1,053	13	5
June 30, 1903	...	...	...	...	...	286	6	2
						£1,516	6	7

On May 31, 1904, when Professor Towar resigned office, instead of there being an available surplus at the Treasury, the farm deposit account showed a debit balance of £620 12s. 6d. It is right, however, to point out that there is still on hand much available produce, representing about £1,100, that will be sold as opportunity offers.

It is of interest to point out what these transfers have actually represented to the State in the past. In July, 1899, the college farm, consisting at that time of 1,230 acres, was handed over to Professor Lowrie, with stock and plant valued at £1,809 13s. 3d., to be worked out of its own revenue. Since that date the farm has never received a penny from the State in the form of Parliamentary vote or subsidy in any form whatsoever, whilst up to June, 1903, it had handed over to the Treasury, in the form of credit balances, £1,516 6s. 7d. If we assume that 4s. an acre is a fair rental for land in this district, the total rental for the four years up to June, 1903, would be represented by £984. This would leave available £532 1s. 7d. to represent interest on original valuation of stock and plant, viz., on £1,809 13s. 3d., or £133 0s. 5d. per annum, or nearly 7½ per cent. It will be noted, therefore, that from 1899 to 1903 not only has the farm received nothing in the shape of a Parliamentary grant, but out of its own returns it has raised the value of the original stock and plant from £1,809

13s. 3d. to £4,154 12s. 2d., besides paying into the Treasury during this period sums equivalent to a fair rental on the land, and good interest and depreciation on the stock and plant originally handed over.

To the unsatisfactory condition of the various accounts, balances of which constitute the profit and loss statement, I must again call attention. Whilst taken together they represent correctly the aggregate result of the various farm transactions during the past year, taken individually they are purely fictitious balances, in no wise indicating the profitableness or unprofitableness of the special transactions they are supposed to represent. What I stated last year I still maintain, viz., that in an institution such as the Roseworthy College the accounts should be so kept as to bring clearly into relief what section of the farm work was profitable and what unprofitable. Unquestionably this would involve slightly more labour and trouble, but it would confer upon the yearly statement of accounts an interest that is very far from attaching to them in the present state of affairs.

Profit and Loss Statement, March 31, 1904.

	£	s.	d.		£	s.	d.
To bags account	19	3	0	By straw account	112	13	1
Sundry expenses	22	3	9	Hay and chaff account	200	9	6
Sundries account	131	15	11	Seeds, various, account	86	3	2
Implement account	117	0	3	Sheep account	498	9	10
Manure account	144	13	5	Pigs account	286	2	2
Harness account	15	7	2	Wheat account	243	8	8
Garden account	19	11	0	Cattle account	178	7	4
Labour	655	19	9	Miscellaneous account	6	8	0
Horses account	33	14	2				
Freights and carriage	56	1	5				
Improvements	24	11	2				
Balance	372	0	9				
	£1,612	1	9		£1,612	1	9
	£	s.	d.		£	s.	d.
Net capital, 1/4/03	5,670	18	9	Net capital, 31/3/04	6,042	19	6
Increase (balance)	372	0	9				
	£6,042	19	6		£6,042	19	6

I propose supplementing at an early date the above statement by an analysis of the various transactions of the past year.

ARTHUR J. PERKINS, Secretary for Agriculture.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

The first ploughing, though somewhat retarded by the recent rains, is now practically finished, and the throwing back will be proceeded with at once. July has proved really wetter than June. This is an advantage rather, for there has been no excessively heavy fall of rain to flood the land and render it unworkable. All the rain soaked into the soil without beating it down hard on the surface. The total rainfall for the half-year ending June 30 was 8.23 in.

We have now a considerable amount of pruning to do, but good progress has been made, and we hope to be finished in good time.

The racking of young wines has been attended to.

The sugar gums extending from the College to the road have been grubbed, and their places will be taken by an avenue of pines (Aleppo pine). A light, temporary fence is to be erected on the roads to protect the young pines planted there. They are at the mercy of all kinds of stock roaming on the roads, and are constantly receiving checks to their growth.

THE DEVELOPMENT OF THE SEEDLESS CURRANT BERRY.

TO THE EDITOR OF *The Journal of Agriculture*.

Sir—In the March number of *The Journal* is a very interesting article under above heading from your pen, giving particulars of your experiments with the currant vine, which give colour to the theory that the seedless fruit is set through the fertilising influence of pollen.

You commence with a quotation from Dr. E. Strasburger:—"A fruit is the product of the changes induced by fertilisation in the persistent parts of the flower." In conclusion you say:—"The burden of proof lies with those who imagine that the general laws of Nature do not hold good in this special case."

If Dr. Strasburger's definition of a fruit includes, as you assume, not only the seed, but the flesh or pulp, even if seedless, he is certainly wrong as regards at least one of our garden fruits, the common fig. Our cultivated fruits and vegetables are so altered by the hand of man that they cannot be expected to follow in all particulars the laws that apply to plants in their natural state. In the currant it is almost impossible to prove that the fruit is produced without the fertilising influence of pollen, unless it would produce seedless fruit after having the stigma removed as well as the anthers at the time of emasculation. With the fig it is different. The fruit is produced without the possibility of any influence from pollen, and, if in one case, why not in another? To make this clear to the general reader I will give a short description of the fig and the way it is fertilised. The blossoms of the fig are inside the fruit, which may easily be seen by cutting a green one in half. In our common garden figs the blossoms are all female or pistilate, except possibly a few around the opening at the top of the fig: in any case, these never mature sufficiently to bear any pollen. The wild fig, or Capri fig, is quite different. The upper portion of the internal cavity of the fig is covered with male or staminate blossoms, which, on the fig arriving at maturity, yield an enormous quantity of pollen. One remarkable feature is that this pollen is not produced until the succeeding crop of figs is half grown, and in the susceptible state to receive it. Thus, the fig wasp, which lives in the Capri fig, carries out pollen from the first crop figs and enters the young second crop figs and fertilises them, and so on from second to third crop. It will be seen that by the late maturing of the pollen it is quite impossible for a fig to be self-fertilised, and, as we have not yet introduced the fig wasp, none of our figs are fertilised unless artificially. Our common figs produce no pollen, and if they did, it would not be available until the fig was nearly ripe, so that there can be no question about the fruit in this case being produced without its influence.—I am, Sir, etc.,

THOS. B. ROBSON.

EDITOR'S COMMENT.

Whilst acknowledging the courtesy of Mr. Robson's criticism, I regret exceedingly my inability to discover in it any point that might have led me to modify my views on the mode of development of the seedless currant berry. The time that has elapsed since I dealt with this subject in *The Journal of Agriculture* is too brief to render advisable any lengthy repetition of my earlier arguments. I must, therefore, confine myself to the statement that, as a consequence of direct experiments conducted last season, I was forced to the conclusion that the balance of evidence pointed to the probability of the normal fertilisation of the currant ovule, and of abortion of the fertilised seed at a later period. Such a conclusion is so much in harmony with what is known to occur with other plants that I felt justified in stating, as Mr. Robson points out, that "the burden of proof lies with those who imagine that the general laws of Nature do not hold good in this special case." To this position I must express my continued adherence, and in it I believe I shall find most thinking men.

Mr. Robson expresses it as his opinion that it is almost impossible to give direct proof of the development of the currant berry without the intervention of the pollen. If such, indeed, is the case, why entertain a belief not in accordance with the observed laws of Nature, and in support of which as yet not a tittle of reliable evidence has been brought forward? That our cultivated fruits and vegetables constitute in the realm of Nature so many mon-

strosities that would not survive the disappearance of man from this planet will be readily admitted by everybody; but to infer therefrom that they have been obtained in defiance of natural laws, rather than in virtue of a special direction given to the latter by the guiding hand of man, is hardly in accordance with observed facts. Of the latter, it remains yet to be proved that long years of artificial cultivation may in certain instances lead to the development of a succulent empty seed pod, or seedless fruit, without the initial stimulus of fertilisation.

Mr. Robson, however, waves aside my plea for proofs, and proceeds, as was done before him, to argue from analogy. In the development of the fig, he asserts, we have an undoubted example of a fruit produced without the intervention of pollen. And, he adds, in the circumstances, why refuse to recognise a similar phenomenon in the development of the seedless currant berry? I can only say: that were we to admit as demonstrably correct what Mr. Robson so positively asserts of the development of the fig we would be as far as ever from any proof of the development of the currant in similar anomalous circumstances.

Is Mr. Robson, however, in a position to substantiate his absolute denial of the intervention of pollen in the development of the *fruit* of the fig? Without pretending to the possession of any deep knowledge of this special question, I am inclined to think that he cannot do so. And, moreover, his very arguments appear to me to point to quite the opposite conclusion. To clear away possible misconceptions, it may be as well to point out that what we know as the mature fig is not in reality a true fruit at all, but what botanists call a *pseudocarp*, or false fruit. The fleshy edible portion of this so-called fruit represents simply an abnormal development of the fruit stalk and its subdivisions, which, originally open and flat—as remains permanently the case in the closely allied genus *Dorstenia*—rise up, and meet towards the summit, so as to form a hollow, pear-shaped receptacle, in which are originally borne the flowers, male and female, and, at a later date, the hard, dry, *true fruit*. If, therefore, as Mr. Robson avers, there is no fertilisation, so there can be no fruit. The celebrated botanist Sachs, however, apparently takes a view quite contrary to that held by Mr. Robson, for, in commenting on the fig, we find him stating:—"Sometimes the long series of deep-seated changes induced by fertilisation extends also to parts which do not belong to the ovary, and even to some which have never belonged to the flower."

As tending to prove that no fertilisation of the pistillate flowers can possibly take place in the fig, Mr. Robson states that the pollen of the male flowers, placed near the opening, only becomes available in a late stage of development of the fig. This statement I am in a position neither to contradict nor to confirm; but, assuming it to be correct, we can feel assured that the late development of the pollen points either to similar late development of the female flowers, or else to a device common to many flowers, having for object the avoidance of self-fertilisation. And whatever may be the stage at which fertilisation takes place, Mr. Robson must remember that until the flowers are converted into fruits we have in the fig merely an example of an agglomeration of flowers within a more or less succulent receptacle, but no fruit.

And, finally, the case of the Smyrna fig, that Mr. Robson brings forward, the Smyrna fig that with us manifestly never goes beyond the flower stage, because of the absence of insects normally inducing its fertilisation, does it not suggest the fact that fertilisation, so essential to its own development is accomplished in our ordinary cultivated figs in some manner that has escaped Mr. Robson's observations?

In conclusion, I can only add that whilst I recognise the interest of Mr. Robson's observations I cannot admit that they in any way invalidate the position I was led to assume some months back concerning the development of the seedless currant berry.

A. J. P.

ALCOHOLIC STRENGTH OF WINES SHIPPED TO LONDON.

By ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

Enquiries frequently reach me as to what should be the alcoholic strength of wines exported to England. Particularly is this the case with reference to sweet wines. Latterly I have carefully tested the strengths of all wines coming before me for certificate, and I now take the opportunity of publishing what results are available up to date:—

DRY RED WINES.

Reference Number.	Locality where made	Percentage in Absolute Alcohol.	Percentage in Proof Spirit.
1.	Teatree Gully	13.10	22.96
2.	Clare	14.30	25.06
3.	Clare	12.95	22.69
4.	Reynella	14.10	24.71
5.	Kanmantoo	13.10	22.96
9.	Angaston	13.65	23.92
11.	Kanmantoo	13.10	22.96
15.	Happy Valley	13.20	23.13
16.	Happy Valley	12.30	21.55
19.	Auburn	13.95	24.45
20.	Tanunda	13.60	23.83
Mean.	...	13.40	23.48

DRY WHITE WINES.

7.	Tanunda	13.10	22.96
8.	Reynella	12.35	21.64
10.	Magill	12.60	22.08
12.	Clarendon	12.40	21.73
Mean.	...	12.61	22.10

SWEET RED WINES.

6.	Tanunda	16.20	28.39
13.	Coonawarra	16.45	28.83
17.	Reynella	17.00	29.79
18.	Tanunda	16.10	28.21
Mean.	...	16.44	28.81

It will be seen that the mean for dry red wines has been 23.48 per cent. proof spirit; for dry white wines, 22.10 per cent.; and for sweet red wines, 28.81 per cent.

I had submitted to me the other day a sweet red wine that had not been fortified, the strength of which proved to be so high that it is worth putting on record. On July 11 the wine was working slightly, and tested 18.35 per cent. of absolute alcohol, or 32.16 per cent. of proof spirit. I re-examined the wine on August 2, and found that it had in the meanwhile risen to 18.70 per cent. of absolute alcohol, or 32.77 per cent. of proof spirit. I take it that such figures are very remarkable for an unfortified wine.

THE PHYLLOXERA BOARD AT WORK.

By ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

At the July meeting of the Phylloxera Board financial statements for the year 1903-04 were tabled by the Secretary. These statements are reproduced in full herewith for the information of vinegrowers. To the initiated any explanatory notes of mine in reference to them will, no doubt, prove quite supererogatory. There are others, however, to consider, and I take it that the tone alone of a discussion on this very subject initiated at a recent meeting of the South Australian Vinegrowers' Association affords ample justification for the amount of ancient history I feel compelled to introduce into this examination of the financial position of the Board.

It seems necessary to point out that for the last twenty-five to thirty years the vineyards of Victoria and New South Wales have been phylloxera-infested, and that up to 1899 these two States made some pretence at stemming the pro-

gress of the pest. Since the latter year, however, the phylloxera has been left very much to its own devices, and growers have been generously granted permission to rebuild their destroyed vineyards on American phylloxera-proof stock. This change of tactics, which hitherto has represented nothing to Victorian and New South Wales growers—for I question whether outside the State nurseries and vineyards it would be possible to-day to account for 50 acres of vines on resistant stocks in both States—this change of tactics has created a position fraught with considerable danger to our own unaffected vineyards. And it was full appreciation of this danger that was mainly responsible for bringing into existence the Phylloxera Board. Local growers felt that sooner or later their vineyards would be in danger of infection; that every lesson of the past pointed to immediate and radical measures as alone of any real effect in the early stages of invasion; and that to give effect to the latter, both freedom of control and available capital were necessary. In 1899 Parliament was asked to pass a Bill throwing the whole responsibility of the phylloxera question on a Board, elected by the growers, and empowered to declare a yearly assessment on all vineyards, for the purpose of meeting ordinary expenses, and creating out of available balances a capital wherewith to fight the pest adequately on its first appearance in the State.

When the Board first met, the question of keeping all vineyards under regular supervision was immediately brought up. In connection with this question it was justly felt that unless the vineyards were subject to periodical visits, during the course of which their state of health was put on record, it would probably prove impossible to detect the phylloxera in the early stages of its appearance in the State, and the opportunity of confining the zone of infection to a restricted area would probably be lost. It was, therefore, unanimously decided that the Board employ a regular inspector, whose duty it would be to inspect, at least once in two years, every vineyard in the State. And it is thus that to-day the main source of expenditure of the Board is represented by the periodical inspection to which all our vineyards are subjected. I assume that there is nobody in this State having any stake in the vine-growing industry who is at all likely to find fault with an expenditure so legitimate. It may be looked at in the light of insurance on the lowest of premiums.

The ordinary expenditure of the Board does not appear likely to exceed by much £400 per annum, whilst its revenue from rates will vary from £1,100 to £1,200, and that from invested funds will increase regularly from year to year. The amount invested on June 30 was represented by £2,000 in Treasury bills. It would be unwise to reduce the rates until sufficient capital has been accumulated to provide in interest wherewithal to cover the ordinary expenditure of the Board. A sum of £10,000 in Treasury bills would just about meet the requirements of the position, and on the assumption that no unforeseen expenditure has to be met in the interval this sum will probably be accumulated by 1910 or 1911.

Past expenditure and receipts may be represented as follows:—

	Receipts.	Expenditure.
February, 1900, to June, 1902	£1,933 3 9	£994 2 9
July, 1902, to June, 1903	1,182 1 11	405 16 10
July, 1903, to June, 1904	1,145 7 5	463 1 6
Balance		2,397 12 0
	£4,260 13 1	£4,260 13 1

It should be remembered that in 1900 the Board started operations under considerable difficulties. Through an error in drafting the Bill the Board had no power to declare a rate until 1901: and as it had in the meanwhile to carry on its work, the difficulty was overcome by borrowing from the Government at different intervals sums amounting in the aggregate to £600. This sum had, of course, to be paid back before any money could be set aside towards the capital that has been accumulating since.

The cost of collecting £1,100 to £1,200 in rates may appear somewhat high at £70. It should be remembered, however, that individual rates are very small, and that in consequence 6 per cent., or thereabouts, is by no means an excessive charge.

On the balance sheet the available assets are shown as representing £2,397 12s. To this sum should be added £182 16s., representing arrears of taxes not collected by June 30.

THE PHYLLOXERA BOARD.

STATEMENT OF RECEIPTS AND EXPENDITURE FOR TWELVE MONTHS ENDED JUNE 30, 1904

RECEIPTS.			EXPENDITURE.		
To BALANCE FROM LAST ACCOUNT :—			By EXPENSES OF THE BOARD :—		
Treasury Bills	£	s. d.	Paid from Advances made by H.M. Government—	£	s. d.
H.M. Government	1,200	0 0	Secretary's Salary	52	5 9
Bank of New South Wales	498	3 0	Inspector's Salary	155	2 10
Cash in hands of Secretary	14	16 5	Travelling Expenses	85	15 7
	2	6 8	General Expenses	67	0 0
			Advertising and Printing	31	17 3
RATES ACCOUNT, 1903/4 :—					
Collected by Commissioner of Taxes, under Clause 20 of the Phylloxera Act No. 724 of 1899	1,103	16 7	COMMISSIONER OF TAXES :—		
INTEREST ACCOUNT :—			Expenses collecting rates, clerical assistance, etc....		
On Treasury Bills	41	10 10	BALANCE :—		
			Treasury Bills	2,000	0 0
			Cash in hands of Treasurer	230	19 6
			Cash in Bank of New South Wales	166	0 7
			Cash in hands of Secretary	0	11 11
				2,397	12 0
				£2,860	13 6

I have examined the above Statement of Receipts and Expenditure for the twelve months ended June 30, 1904, and compared the same with the books and vouchers presented, and certify the same to be correct.

(Signed) JOHN CHRISTISON, CHAIRMAN.
W. GEORGE AULD, SECRETARY.

W. M. S. KEKWICK, A.I.A.S.A.,
AUDITOR.

BALANCE-SHEET FOR TWELVE MONTHS ENDED JUNE 30, 1904.

LIABILITIES.		ASSETS.	
REVENUE ACCOUNT :—	£	TREASURY BILLS :—	£
Balance at credit of this Account	2,397 12 0	Amount invested by Board	2,000 0 0
		H.M. Government :—	230 19 6
		Balance of Rates in hands of Treasurer	166 0 7
		BANK OF NEW SOUTH WALES :—	0 11 11
		Balance of Current Account	0 11 11
		CASH :—	
		In hands of Secretary	£2,397 12 0

I have examined the above balance-sheet and compared the same with the books, securities, and vouchers presented, and certify that in my opinion the same is a full and fair balance-sheet, and exhibits a true and correct statement of the position of the Board on June 30, 1904.

(Signed) JOHN CHRISTISON, CHAIRMAN.
W. GEORGE AULD, SECRETARY.

W. M. S. KEKWICK, A.I.A.S.A.,
AUDITOR.

LEAF SPOT OR BLIGHT OF POTATOES.

During the past few years we have had frequent reports of disease causing much injury to potatoes. The growers refer to the trouble as "leaf spot" or "blight," and it is unquestionably of fungus origin. Whether there are two diseases or not is uncertain, as we have no records of any specimens of diseased plants having been submitted to a competent authority for identification. In some of our hills districts the summer crop often suffers very severely. A promising crop will be attacked, and within a week or two will be more or less ruined, according to the maturity of the plants when attacked. Some growers state that where formerly they were able to produce two crops of potatoes each year the disease makes it too risky to plant late. So far as we know, there has been little or no attempt to combat the disease by spraying, but in America much has been accomplished in the treatment of potato diseases by this means.

In the State of New York the area devoted to the cultivation of potatoes is nearly 400,000 acres, and it is estimated that in a single season "potato blight" has caused a loss of nearly £2,000,000 to the growers. Such heavy losses on one of the staple crops of the State has naturally caused the officers of the Agricultural Experiment Station to devote considerable attention to the possibility of protecting the crops from injury. Various experiments having demonstrated the possibility of achieving the desired end by the use of Bordeaux mixture, in 1902 the station started a series of experiments, to extend over a period of ten years, to determine the percentage of the crop that could be thus saved, and the cost of the operation. As the losses from blight vary from year to year according to climatic conditions, a series of tests were necessary to show whether it would be profitable to make spraying a part of the regular routine of cultural operations. The report of the second year's operations, recently issued, contains some interesting information concerning the progress of the experiments.

The work is being carried out on the same lines at two different localities by officers of the experiment station. Tests are being made of the effects of spraying about every second week after the plants are about 8 in. to 1 ft. in height, and of giving three sprayings only. It must, of course, be remembered that the treatment is preventive, and operations must be commenced before there is any sign of disease. In New York State the presence of Colorado beetle and the flea beetle renders it necessary to also apply poison, usually arsenic or Paris green. This to a large extent governs the other operations, as the poison is added to the Bordeaux mixture and applied as soon as the presence of the insects in any quantity is noticed. The spraying is sometimes commenced on this account earlier than would be the case if the fungus only was to be combatted. In addition to the two experiments referred to, five large potato growers co-operated with the station in carrying out experiments to determine the net profit of spraying under ordinary conditions. The areas varied from $3\frac{1}{2}$ acres in extent to $15\frac{1}{2}$ acres. In each experiment the spraying outfit was drawn by horsepower. In one or two instances large, two-horse outfits working five or six nozzles, and treating as many rows at one operation, were used. The rows were 2 ft. 6 in. to 3 ft. apart, and the plants 15 in. apart in the rows. These wide rows greatly facilitate the use of horse power in all cultural operations, and also lessen the quantity of spray required. The amount used varies from 40 gallons to 100 gallons per acre at each spraying.

The diseases known in New York State under the name of "blight" are Early Blight (*Alternaria solani*) and Late Blight (*Phytophthora infestans*), of which the latter is generally by far the more destructive. The following table summarises the results of the two years' experiments undertaken by the officers of the station:—

Plot Treated.	Geneva—Yield per Acre.				Riverhead—Yield per Acre.			
	1902.		1903.		1902.		1903.	
	Marketable Potatoes.	Increase due to Spraying.	Marketable Potatoes.	Increase due to Spraying.	Marketable Potatoes.	Increase due to Spraying.	Marketable Potatoes.	Increase due to Spraying.
	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.
3 times ..	170 21	52 93	140 40	46 108	158 74	15 30	132 19	21 21
5 to 7 times ..	183 60	66 20	156 68	63 24	167 51	24 7	140 110	30 0
*Not sprayed	117 40	—	93 44	—	143 44	—	110 110	—

* These plots were treated with arsenic to destroy beetles.

The average increase per acre due to spraying has been:—At Geneva, three sprayings, 49 cwt. 100½ lb.; five to seven sprayings, 64 cwt. 78 lb.: and at Riverhead, 18 cwt. 25½ lb., and 27 cwt. 3½ lb. respectively. The great variation between the figures at the two places appears to be mainly due to the fact that the disease has not been so severe at Riverhead. In addition, however, the potatoes at Riverhead suffered from a late attack of beetles, and the sprayed crops, being green when the unsprayed was dying off, suffered most.

In the following table will be found the results of the tests on a large scale, carried out last year by the growers themselves:—

Experiment.	Area Treated.	No. of times Sprayed.	Total Cost of Spraying.	Cost per Acre.	Increased yield per Acre due to Spraying.	Cost per ton of increased yield.
	Acres.		£ s. d.	£ s. d.	cwt. lbs.	£ s. d.
Jagger ...	13	4	10 9 1	0 16 1	28 104	0 11 1
Salisbury 1 ...	10	5	8 4 6	0 16 5½	33 54	0 9 10
Salisbury 2 ...	14	5	12 11 0	0 17 11	34 32	0 10 5
Welch ...	3½	5	2 15 2	0 15 9	40 80	0 7 9
Martin ...	15½	16	19 15 7	1 5 3	41 48	0 12 3
Dobson ...	5	3	8 4 3	1 12 10	3 84	8 15 0

The costs of the Dobson experiment are so excessive, compared with the other experiments, that they cannot be regarded as a fair indication of the outlay involved in the operation of spraying. The high cost per ton of the crop saved is due mainly to this heavy outlay and also to the very light attack of blight, there being but little injury on the unsprayed crop. It will be seen that the cost of saving the increased yields on the other plots averaged out at about 10s. 3d. per ton.

With our smaller areas it is doubtful whether we could do our spraying at the cost stated, as horsepower outfit would not be used. At the same time, however, it should be pointed out that the work could be done under the same conditions here cheaper than in New York, owing to difference in cost of materials. The average cost of the five experiments works out at 78 cents per acre for each spraying; the Salisbury experiments were calculated to cost 80 cents., and as the owner undertook to spray a number of his neighbours'

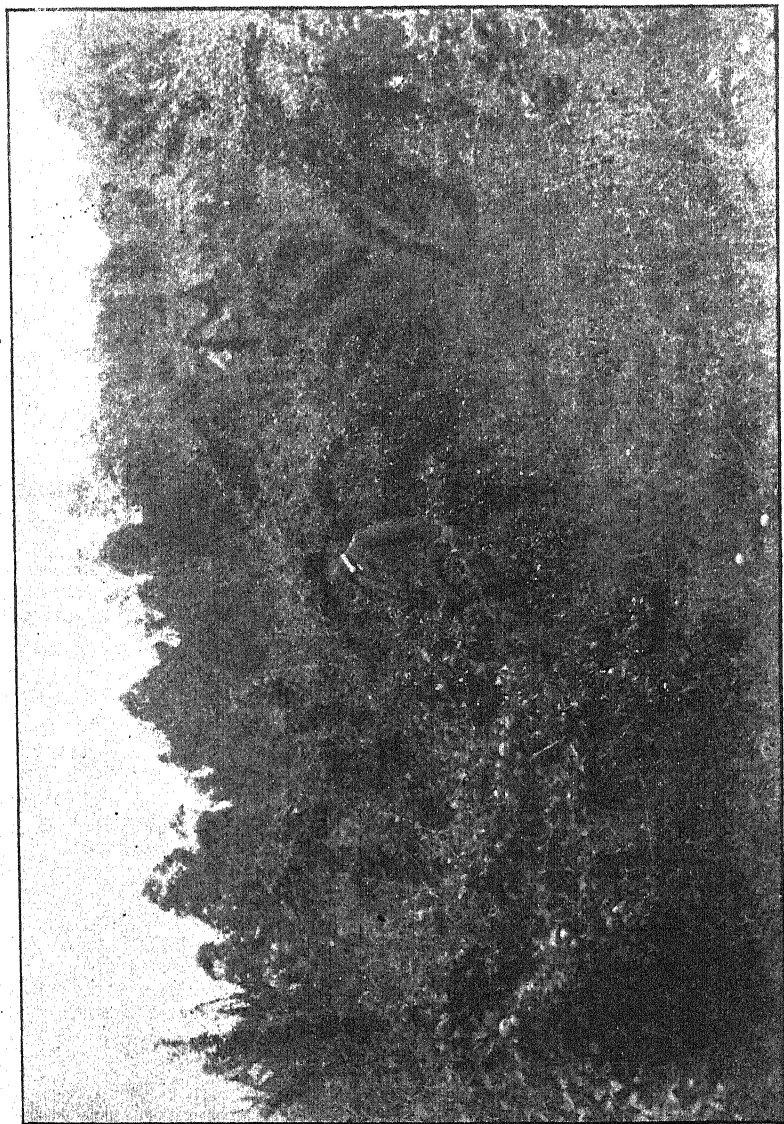


Plate 1.—Block of Scarlet Nonpareil apple trees in the Rev. E. H. Thompson's orchard at Franklin, showing heavy cropping capacity of trees.

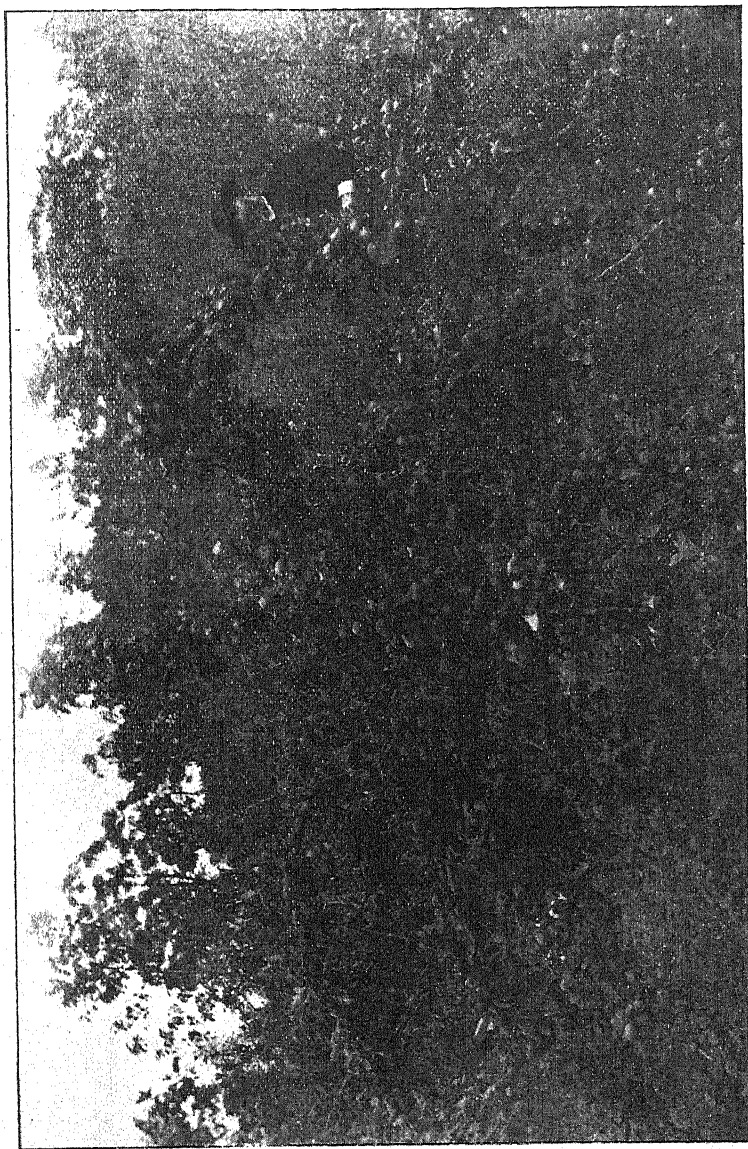


Plate II.—Average specimen of Scarlet Nonpareil apple tree from row shown in Plate I.



Plate III.—Type of Sturmer apple tree in the Rev. E. H. Thompson's orchard, Franklin.



Plato IV.—Old Sturmer apple tree in Bushby Park Estate, Derwent Valley, grown under irrigation.

altitude of more than a few hundred feet above sea level. This is adhered to with a rigidity which probably is backed up by experience. On the mainland—and more especially in this State—the contrary course is followed, and only elevated localities chosen. This proves the most successful course here, mainly because in such districts the proper combinations of solar heat and adequate moisture are alone available, and why may not identical causes guide the Tasmanian growers?

After carefully weighing the evidence obtainable subsequent upon visits paid to the Huon Valley, with its high rainfall; the Glenorchy and Kangaroo Valley, with their 26 to 28 in. annually; the Derwent Valley, with only a moderate rainfall (about 23 in.), assisted by irrigation; and the Bagdad Valley, with its ordinary rainfall equal to that of the Adelaide plains, I can come to no other conclusion than that these districts present all of the characteristics—minus a little summer heat and the stronger soil—which are found in the Mount Lofty Ranges and Onkaparinga Valley, with their 30 to 35 in.; the South-East (Coonawarra), with 27 to 28 in.; the Clare, with 23 to 26 in.; and the Barossa and Wirrabara, with their 20 to 24 in. annually. This greater amount of sun heat hastens the maturity of our trees, causes the fruits to ripen earlier in the season, and is conducive to heavy fruitage, and who will say these are not distinct advantages? After comparing these and other considerations, I am not loth to arrive at the conclusion that Tasmania's supremacy in apple-growing over our State is not due to any superiority of position, but simply to the methodical practices followed by her sturdy sons of the soil. By carefully applying well-established practices, which can be demonstrated to be based upon sound economic principles, the Tasmanian apple-grower has turned his trees into what may be termed living fruit-producing machines. The soil prior to planting is well prepared, the trees are planted thickly (from 12 to 15 ft. apart being the common distances), and they are trained in such a manner as to place the minimum of wasted energy in the bonfire after the completion of each winter's pruning work. Yields of 300 bushels and upwards per acre were freely quoted to me as nothing exceptional, and this for a period of successive seasons. When one considers that this only means an average of from 1 to 2 bushels per tree when they are planted at the above-named distances apart, it is—with regular manipulation of the fruiting wood—not a source for wonderment.

The Tasmanian has found out which sorts suit his conditions best, and he grows those and those only. A Mr. Murdoch, of Glenorchy, assured me that he had taken 1,500 bushels of apples and nearly 800 bushels of gooseberries from a block of 3 acres. Another gentleman, at Kangaroo Valley, stated he had taken 2,600 bushels from 6½ acres of apple trees. And another well-known gentleman, on the Huon River, assured me his orchard had averaged 300 bushels per acre over several seasons. These figures are exceeded in some orchards in South Australia during some seasons, but, as a rule, the following year the production is about one-tenth of that quantity. During the past season Mr. McBain, the manager of the orchards and vineyards of the Yallum Estate, at Coonawarra, states that he sold 1,300 bushels of first-class fruit and upwards of 100 bushels of inferior quality from 448 Rokewood trees growing there. At 20 ft. apart this number represents an area of about 4½ acres. One may reasonably ask what quantity will they bear next year? In a future article I hope to deal with this matter from a practical point of view. Meanwhile the accompanying illustrations convey an idea of the cropping powers of some Tasmanian apple trees, and it may be added that these were not discovered after much diligent searching.

DEPARTMENTAL NOTES AND WORK.

The newly appointed Dairy Instructor for South Australia, Mr. P. H. Suter, will take up his duties at the Agricultural College at the beginning of August. Mr. Suter is the holder of the Dookie Agricultural College Diploma, and, after eight or nine years' service in various cheese and butter factories in Victoria, for the greater portion of the time as Manager. Mr. Suter was appointed to the position of Dairy Instructor at the Hawkesbury Agricultural College, a position he held for three and a half years, and which he relinquishes to take a similar position in South Australia. Mr. Suter will be stationed at the Roseworthy Agricultural College, and will have charge of the dairy herd and the teaching of dairying subjects. His services will also be available to factory managers and others practically engaged in dairying, and he will visit the factories as his other duties permit. All letters should be addressed to Mr. P. H. Suter, Dairy Instructor, Agricultural College, Roseworthy.

During the months of June and July besides attending to departmental duties in Adelaide, Mr. Quinn has continued his lectures at the School of Mines and Industries and at the Agricultural College at Roseworthy. Meetings to explain and discuss the provisions of the proposed Vegetation Diseases Bill were attended by him at Gumeracha, Angaston, Nuriootpa, Woodside, Stansbury, and Coonawarra. With the exception of the last-named place motions adverse to its adoption were passed.

During the above months Mr. Quinn has given public demonstrations of the winter pruning of fruit trees at Clare, Watervale, Penwortham, Stanley Flat, Gumeracha, Angaston, Nuriootpa, Saddleworth, Stansbury, and Coonawarra. Besides these, instruction and demonstrations have been given on the same subject in private orchards at Mount Crawford, Coromandel Valley, Medindie, and other suburban localities.

During June the Inspectors under the Vine, Fruit, and Vegetable Protection Act admitted 8,363 bushels of fruits, chiefly of a tropical character, 93 packages of plants, including 10,400 fruit trees, while 29 packages were detained on account of the absence of the necessary declarations *re* the freedom from phylloxera of the gardens whence they came, and 248 cases of overripe bananas were destroyed on suspicion of being diseased.

In the same month, 4,642 bushels of fruits, 127 packages of plants, and 2,925 packages of vegetables were passed for export to States requiring a certificate of freedom from diseases with each lot.

During July 7,366 bushels of fruits, 71 packages of trees and plants, including 3,138 fruit trees and 7,000 stocks upon which to graft fruit trees, were admitted by the Inspectors of Fruits, etc., while 15 parcels were detained or destroyed, owing to the necessary declarations not being forthcoming. One hundred and ninety-six cases of tropical fruits were destroyed owing to the presence or suspected presence of fruit fly larvæ. The exports to other States which demand certificates of cleanliness with the consignments consisted of 4,343 bushels of fruits, 126 parcels of plants, and 2,739 packages of vegetables. The fruits consisted mainly of apples and oranges, and the vegetables were of a very varied nature and of excellent quality.

AGRICULTURAL BUREAU CONGRESS.

The sixteenth annual Congress of the Agricultural Bureau will be held in the Brookman Hall of the New School of Mines Building, North terrace, Adelaide, during September Show week. The first session will be held on the evening of Tuesday, September 6, when the Hon. Minister of Agriculture will deliver his opening address. Sessions will also be held on Wednesday morning and evening and Thursday morning and evening. Owing to the show being opened on Wednesday afternoon we cannot arrange for any meeting during the afternoon of that day.

In view of the number of meetings of other organisations during show week, members of the Bureau will be asked to discuss the advisableness of starting Congress meetings in future on the Tuesday morning, and finishing on Thursday morning. This will of course necessitate members coming to town a little earlier, but there should not be much difficulty on this point.

All members of the Bureau who are in town during show week are particularly requested to attend meetings of Congress. All others interested in agriculture are invited to attend.

The usual farmers' visit to Roseworthy College will be arranged by the Hon. Minister. Full particulars will be announced at the Congress meetings.

The Annual Conference of the Hills Branches of the Agricultural Bureau will be held at Woodside on Friday, October 21. The members of Hills Branches are asked to assist in making the Conference a success.

SOURSOPS ON THE BROUGHTON.

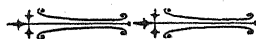
A recent visitor to the office of the Department of Agriculture stated that when travelling through the Lower North recently he noticed that the "soursops" (*Oxalis cernua*) had taken possession of several relatively large areas of the rich Broughton Flats, between Koolunga and the lower part of the river. This weed has proved exceedingly troublesome in the southern parts of the State, and has completely choked out all other vegetation of value in many parts; in fact, it is questionable whether any other weed we have to contend with has caused greater trouble to the owners of property. It is, therefore, to be regretted that it should have been allowed to get a hold in one of our best farming areas. There can be little doubt that unless vigorous action is taken to destroy it at once it will prove as troublesome to the landowners as it has in the South.

We believe the most effective way to deal with the infested areas would be to either fallow up the land, work it down well and sow with lucerne in the spring, or to cut the plant and apply a solution of bluestone. If the former method is adopted the paddock should be made pig proof, and later on, when the lucerne has secured a firm hold, pigs can be turned in. The animals will not only convert the lucerne into pork, but will root up the oxalis wherever it appears, as they eat the bulbs with relish. We are not aware whether treatment with bluestone has been tried anywhere, but it is certainly worthy of a test. Cutting the plants would be necessary to facilitate the action of the poison. The solution should be made by dissolving 2 lb. of bluestone in five gallons of water. It would not, of course, pay to apply this treatment to large areas of land, as the cost of two or three applications would be prohibitive, but where relatively small areas are to be dealt with to prevent the spread of the weed on rich land, it will be worth some expense on the part of the landowner. Constant cultivation of infested land will in time reduce the plant materially, but under ordinary circumstances this cannot be carried out to a sufficient extent to be effective.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Amyton ..	Aug. 25	Sept. 22	Morgan ..	Aug. 20	Sept. 24
Balaklava ..	13	10	Mount Bryan East ..	27	—
Booleroo Centre ..	23	20	Mount Pleasant ..	12	—
Bowhill ..	19	3	Mount Remarkable ..	25	22
Brinkworth ..	5	2	Mundoorra ..	26	23
Burra ..	19	16	Nantawarra ..	24	21
Bute ..	22	—	Naracoorte ..	13	10
Carrieton ..	29	20	Narridy ..	20	—
Cherry Gardens ..	9	13	Norton's Summit ..	26	23
Clare ..	22	23	Onetree Hill ..	25	22
Clarendon ..	8	—	Orroroo ..	26	—
Colton ..	6	3	Paskeville ..	20	—
Crystal Brook ..	20	—	Penola ..	13	—
Dawson ..	20	—	Petina ..	20	17
Elbow Hill ..	23	20	Pine Forest ..	23	20
Endunda ..	22	26	Port Broughton ..	25	22
Finniss ..	1	5	Port Elliot ..	20	17
Forest Range ..	25	22	Port Lincoln ..	19	17
Forster ..	13	—	Port Pirie ..	20	—
Gawler River ..	26	23	Pyap ..	3	7
Gladstone ..	6	—	Redhill ..	23	—
Golden Grove ..	25	22	Reeves Plains ..	26	23
Hartley ..	26	—	Rhine Villa ..	26	23
Inkerman ..	23	20	Richman's Creek ..	22	26
Johnsburg ..	20	24	Riverton ..	20	24
Kanmantoo ..	26	23	Saddleworth ..	19	—
Kapunda ..	6	3	Stansbury ..	6	3
Kingscote ..	8	12	Stockport ..	22	26
Kingston ..	6	3	Strathalbyn ..	22	26
Koolunga ..	25	22	Utera Plains ..	20	24
Lucindale ..	20	—	Virginia ..	22	19
Lyndoch ..	25	22	Wandearah ..	22	19
Maitland ..	6	3	Watervale ..	22	19
Mallala ..	1	5	Wepowie ..	23	20
Mannum ..	20	17	Whyte-Yarcowie ..	20	17
Meningie ..	13	10	Willunga ..	6	3
Minlaton ..	13	17	Wilmington ..	24	21
Morchard ..	27	24	Woodside ..	22	—



FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on August 1, 1904:—

The month just closed has been a most favourable one to the agriculturists and pastoralists, the rainfall being heavier and more general than has been recorded for many a long day; indeed, some parts reporting one and a half inches beyond their average. As growing conditions have also been excellent there are abundant supplies of feed and water in nearly each of the far Northern areas. Farmers are well content with the very favourable prospects, the soil having received such a thorough soaking that for some time it can do without further rain.

The wholesale houses report good business during July, country buying orders showing a decided improvement. This, no doubt, being partly the result of moneys for wheat sold coming in, coupled with the very assuring outlook in the farming districts. Metals are generally firmer, Silver holding well, whilst Copper has advanced.

BREADSTUFFS.—The market for U.K. cargoes remained steady until well on in the month, when political unrest, caused by the Russians capturing English merchant steamers, was responsible for a steady advance, and business was done at 31s. 9d. to 31s. 10½d., but at the moment values are hardly so firm, and not more than 31s. 6d. could be obtained. Shippers who had chartered vessels to load were anxious to secure wheat, and as high as 3s. 2d. was paid for large parcels. In this State farmers were disinclined to part with their holdings, and consequently, with one exception, all vessels went on to Melbourne or Sydney to load. During the last few days, however, there has been more disposition shown to meet the market, and sales of fair lines have been effected at 3s. 1d. to 3s. 1½d. **Flour.**—There has been less enquiry for shipment to London and Liverpool, and values in the old country appear not to have improved on the same ratio as wheat; the extra price which Australian millers are now obliged to charge has, no doubt, prevented further business. **Forage.**—Since the rains farmers have been more willing to effect quitance of their Hay, but as the demand is very dull, chaffcutters are not now any too eager to purchase. Certainly, some few shipping parcels from the gulf are finding their way to Sydney, but this is the result of an absence of enquiry for chaff at Port Pirie. **Offal** has been in fair demand, but prices have not altered, a slight firming having been checked. **Feeding Grains.**—The quotations for these are only nominal, grain merchants being disgusted at the very meagre sales that have been put through.

POTATOES.—Sales locally have been fairly heavy, no doubt the low quotations increasing the consumption. A few odd parcels have also found buyers for Western Australia; but, unfortunately, there seems very little hope of any substantial advance in values this season, the market continuing to be depressed owing to the heavy quantities offering, especially in the eastern States. However, as the "Gambiers" now available have mostly to be carted a longer distance, thus incurring extra cost, prices, in sympathy, have hardened. **Onions.**—At this time the call for the tuber is none too heavy, so that the supply from some of the later districts close to Adelaide is pretty well ample for city and suburban wants, therefore Mount Gambier growers have to look to the country and export for an outlet.

DAIRY PRODUCE.—It is rare at this season of the year that all South Australian products are sufficient for demands, but the month just passed has been very exceptional in this direction, for not only is the State self-supplying, especially in butters, but already has a surplus quite equal to fill Broken Hill requirements. With further increasing quantities of fresh in prints continuing to come forward, packers and factories are hopeful of finding a market for these in bulk in Western Australia; at least, until the shipping season opens for London. Eggs have been several pence cheaper per dozen than is usual during winter, the cause undoubtedly being the presence of heavy quantities of refrigerated and pickled sorts, but although the seasonable downward trend in values has apparently set in, no abrupt drop has yet taken place, export buying orders having been fairly extensive. Cheese has had good sale at slightly firmer rates. This applies only to rich and mild flavoured, the old and dry sorts requiring pushing to effect clearance. **Bacon.**—It was thought that the big reduction in values would have caused a better call for the line, but sales of parcels of factory sides are yet most difficult to make, even at the

present low quotations. Hams also continue to be very dull, with no probability of improvement until warmer weather sets in. Honey is having very little enquiry, and shows a slight easing. Almond quotations have been almost stationary.

CARCASE MEAT.—The quantities of pork catalogued each sale have attracted brisk competition, and good prices have ruled, considering the heavy slump that is on in the live market, but farmers would do well to give special attention to the preparing and careful slaughtering of the hogs before marketing. Bright, handy-weight, shop porkers realise top rates. In Veal it will pay to well feed the calves, and only kill when in fit condition, for prime vealers have commanded satisfactory figures, but for poor or hungry-looking carcasses there is hardly any sale. **Dressed Poultry.**—Prime-conditioned and well-trussed birds have secured very fair rates.

In Live Poultry the pleasing feature has been the decided improvement in the quality of those penned, resulting in good values being obtained.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/1 to 3/1½ per bushel, 60 lb.

FLOUR.—City brands, £7/10/- to £7/15/-; country, £7 to £7/5/-.

BRAN.—7½d. to 7¾d.; **POLLARD,** 7¼d. to 7¾d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/4½ to 1/5½ (nominal); White Champions, 1/8 to 1/9 per bushel, 40 lb.

BARLEY.—Cape, 1/8 to 1/10 (nominal), per bushel, 50 lb.

CHAFF.—£2/12/6 (nominal) per ton of 2,240 lb., f.o.b. Port Adelaide.

POTATOES.—Gambiers, £2/10/- per 2,240 lb., f.o.b. Port Adelaide.

ONIONS.—Locals and Gambiers, £3/15/- to £4 per 2,240 lb.

BUTTER.—Factory, creamery, and choice separators, 8½d. to 10d.; good dairies and fair separators, 7½d. to 8½d.; well-graded collectors' and fair dairies, 6½d. to 7d.; mixed to ordinary stores, 5½d. to 6d.

CHEESE.—Factory makes, 5½d. to 6½d. per lb.; aged and dry lots, 4½d. to 5d.

BACON.—Factory-cured sides, 5½d. to 6d.; farm flitches, 5d. to 5½d. per lb.

HAMS.—S.A. factory, 7½d. to 8d. per lb.

EGGS.—Loose, 10d.; in casks, f.o.b., 1/- per dozen.

LARD.—In bladders, 4½d.; tins, 4d. per lb.

HONEY.—2½d. for prime clear extracted, in 60-lb. tins; discoloured and candied, from 1½d. to 2d.; beeswax, 1/.

ALMONDS.—Soft-shells, 4d. to 4½d.; kernels, 8d. per lb.

CARCASE MEAT.—Bright shop porkers, 4½d. to 5d.; medium to fair baconers, 3½d. to 4d.; choppers, 2½d. to 3s.; veal, good quality stuff, 2½d. to 3½d.; poor sorts, 1½d. to 2½d.

DRESSED POULTRY.—Turkeys and ducks, 6½d. to 7½d. per lb.; fowls, 5d. to 6d.

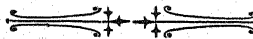
LIVE POULTRY.—Heavy-weight table roosters, 1/9 to 2/2 each; plump hens and fair-conditioned cockerels, 1/2 to 1/8; ordinary hens, 1/- to 1/2; poor and light, 9d. to 11d.; ducks, 1/8 to 2/8, fair to good; geese, 2/9 to 3/9; pigeons, 6d. to 6½d.; turkeys, 4½d. to 6½d. per lb., live weight, for ordinary to good table sorts

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of July, 1904:—

Adelaide ...	2.73	Manoora ...	1.68	Echunga ...	4.18
Hawker ...	2.62	Hoyleton ...	2.12	Macclesfield ...	3.29
Cradock ...	1.63	Balaklava ...	1.73	Meadows ...	4.23
Wilson ...	2.59	Port Wakefield ...	1.68	Strathalbyn ...	1.24
Gordon ...	1.40	Saddleshworth ...	1.78	Callington ...	1.27
Quorn ...	2.18	Marrabel ...	2.00	Langhorne's Bridge	0.93
Port Augusta ...	1.14	Riverton ...	2.58	Milang ...	1.61
Port Germein ...	1.26	Tarlee ...	1.35	Walleraro ...	2.12
Port Pirie ...	1.74	Stockport ...	1.43	Kadina ...	2.57
Crystal Brook ...	2.19	Hamley Bridge ...	1.73	Moonta ...	2.39
Port Broughton ...	1.65	Kapunda ...	1.83	Green's Plains ...	3.22
Bute ...	2.62	Freeling ...	2.34	Maitland ...	3.31
Hammond ...	1.18	Stockwell ...	2.53	Ardrossan ...	2.10
Bruce ...	1.45	Nuriootpa ...	1.99	Port Victoria ...	2.60
Wilmington ...	2.27	Angaston ...	2.69	Curramulka ...	3.35
Melrose ...	4.19	Tanunda ...	3.40	Minlaton ...	2.97
Booleroo Centre ...	2.84	Lyndoch ...	3.93	Stansbury ...	1.64
Wirrabara ...	3.30	Mallala ...	2.17	Warooka ...	2.94
Appila ...	2.23	Roseworthy ...	2.10	Yorke town ...	2.49
Laura ...	2.76	Gawler ...	2.39	Edithburg ...	2.04
Caltowie ...	2.33	Smithfield ...	2.69	Fowler's Bay ...	3.91
Jamestown ...	2.62	Two Wells ...	1.95	Streaky Bay ...	3.13
Gladstone ...	2.46	Virginia ...	2.30	Port Elliston ...	2.61
Georgetown ...	2.92	Salisbury ...	2.27	Port Lincoln ...	2.46
Narridy ...	3.67	Tea Tree Gully ...	3.81	Cowell ...	0.76
Redhill ...	2.43	Magill ...	4.06	Queenscliffe ...	2.87
Koolunga ...	2.70	Mitcham ...	4.58	Port Elliot ...	1.50
Carrieton ...	1.94	Crafers ...	7.11	Goolwa ...	1.43
Eurelia ...	1.83	Clarendon ...	6.25	Meningie ...	2.47
Johnsburg ...	1.34	Morphett Vale ...	2.15	Kingston ...	4.97
Orroroo ...	1.69	Noarlunga ...	1.58	Robe ...	3.30
Black Rock ...	1.87	Willunga ...	3.99	Beachport ...	3.64
Petersburg ...	1.62	Aldinga ...	3.44	Coonalpyn ...	2.10
Yongala ...	2.09	Normanville ...	2.85	Bordertown ...	2.78
Terowie ...	2.00	Yankalilla ...	3.47	Frances ...	3.15
Yarcowie ...	2.05	Eudunda ...	1.37	Naracoorte ...	3.32
Hallett ...	2.37	Truro ...	2.47	Lucindale ...	4.22
Mt. Bryan ...	2.01	Palmer ...	2.18	Penola ...	2.87
Burra ...	1.97	Mount Pleasant ...	4.86	Millicent ...	4.22
Snowtown ...	2.71	Blumberg ...	4.75	Mount Gambier ...	3.42
Brinkworth ...	2.50	Gumeracha ...	5.33	Wellington ...	1.67
Blyth ...	1.91	Lobethal ...	7.00	Murray Bridge ...	1.05
Clare ...	2.78	Woodside ...	5.21	Mannum ...	1.41
Mintaro Central ...	2.39	Hahndorf ...	4.63	Morgan ...	0.80
Watervale ...	3.03	Nairne ...	2.86	Overland Corner ...	1.18
Auburn ...	2.36	Mount Barker ...	4.52	Renmark ...	1.12



AGRICULTURAL BUREAU REPORTS.

Morchard, June 25.

PRESENT—Messrs. Scriven (chair), Longbotham, Kupke, Kitto, Barrie, Martin, Reichstein, Kirkland, Toop, O'Loughlin, and Beck (Hon. Sec.), and four visitors.

TABLE POULTRY.—Members report very unsatisfactory returns for prime young cockerels, about seven months old, dressed and forwarded to Adelaide market. It was thought that the birds must have been badly dressed, or better prices would have been obtained, and it was decided to ask for information on this subject. [See *Journal of Agriculture* for July, 1904.—Ed.]

CULTIVATION.—Mr. Reichstein read a short paper on cultivation of the soil. He advised fallowing as early as possible. The ploughing should be done thoroughly, but on no account would he cut down into a clay subsoil, though with limestone bottom they could go as deep as they chose. He considered it a great mistake to always plough the land to the same depth; it would prove beneficial to go a little deeper than usual now and then. He had found that on the average shallow ploughing gave best results, but in wet seasons land ploughed six inches would yield best. The difficulty was that the farmer could not tell how the seasons would turn out, and could not vary his cultural operations according to season. Members generally agreed with Mr. Reichstein's remarks.

Meadows, June 27.

PRESENT—Messrs. Ellis (chair), Griggs, Brooks, Usher, Nicolle, Catt, and Stone (Hon. Sec.), and three visitors.

VEGETATION DISEASES BILL.—Considerable discussion on this Bill took place. Members were unanimous in their opposition to the provisions of the measure.

Reeves Plains, June 24.

PRESENT—Messrs. Folland (chair), George, McCord, W. and R. Oliver, Winton, Alexander, Carroll, W. and W. H. Day (Hon. Sec.), and two visitors.

STANDARD BUSHEL.—Messrs. McCord and Alexander read short papers on this subject. Both writers protested against the present one-sided method, by which the standard weight each season was fixed by the Corn Trade Section of the Chamber of Commerce, which simply acted in the interests of the wheat merchants. The system of docking wheat under standard, and at the same time refusing to pay extra for wheat over standard, was condemned. The writers could not understand why it was that if wheat weighing 61 lb. per bushel was worth 1d. per bushel less than wheat weighing 62 lb., a sample weighing 63 lb. should not be worth 1d. or thereabouts more than the 62-lb. sample. They urged the farmers to combine and refuse to put up any longer with the present system. It was resolved that, in the opinion of this Branch, there should be a permanent standard of 62 lb. per bushel, with a fixed scale of prices for wheat over or below. It was also decided that the practice of delaying the fixing of the standard was an injustice to the smaller farmers. Members consider that the farmers should have a representative on the body fixing the standard.

Redhill, May '24.

PRESENT—Messrs. Nicholls (chair), Wake, Button, Kelly, Steele, D. and J. N. Lithgow (Hon. Sec.).

DAIRY CATTLE.—Mr. Steele read a short paper on the best breed of cows for this district. He expressed the opinion that the introduction of the Jersey into their herds has resulted in deterioration in the size of the cows. He considered the milking strain of Shorthorn the most profitable for this locality, with which most of the members agreed.

Utera Plains, June 25.

PRESENT—Messrs. Venning (chair), Jacobs, John Deer, sen. and jun., James Deer, Hale, H. and R. J. West, Hornhardt, and Ramsey (Hon. Sec.), and four visitors.

POULTRY.—Mr. James Deer read a short paper on this subject, showing returns from forty fowls during the past six months. The hens did not start laying until March, during which month they produced eggs to value of £1 5s. 10d.; in April to value of £2 11s. 10d.; May, 19s. 5d.; June, 7s. 6½d.; or a total of £5 4s. 7½d., in addition to rearing one sitting of chicks. The only food the fowls received, beyond what they picked up for themselves, was 10 bushels of wheat, worth £1 8s. 4d., leaving a profit of £3 16s. 3½d.

BAGS AS WHEAT.—A long discussion on this subject took place, and it was resolved that this Branch protests against the present system and considers that the wheat should be sold independently of the bags, for which the wheat-buyer should allow a fair value, or replace them with bags of equal quality.

IMPROVEMENT OF DRAUGHT STOCK.—Mr. Jacobs urged the necessity for improving the quality of their draught stock, and suggested that the farmers should form a syndicate amongst themselves to purchase a good stallion for the district. This met with general approval.

RAINFALL.—The following records were handed in:—Salt Creek, May, .91 in.; June, to date, .96 in. Glynn, .87 in. and 1.67 in. respectively.

Paskeville, June 25.

PRESENT—Messrs. Pontifex (chair), Goodall, Palm, Koch, Meier, J. C., S. R., and T. H. Price, and O'Grady (Hon. Sec.), and several visitors.

PREMATURE MILKING OF BROOD MARES.—Members reported several cases of abnormal flow of milk from pregnant mares not due to foal for three months. The udder of the mare develops and the milk runs from the teats. None of the mares have slipped their foals, though some have been in the condition stated for three months. [Without a full history of each case it is not possible to suggest any definite cause for this abnormal flow of milk from pregnant mares.—Ed.]

STARLINGS.—The Hon. Secretary tabled specimen of a starling he had shot. This pest is sufficiently new to this district to create considerable interest, and members were much impressed with the necessity for taking action to prevent them from increasing.

Boothby, June 7.

PRESENT—Messrs. Whyte (chair), Chaplin, Henderson, Leonard, Way, McGown, Robinson, and two visitors.

FARM MANAGEMENT.—Mr. Leonard read a short paper on this subject. He contended that to successfully manage a farm required greater qualifications than many other businesses. The farmer required an intimate knowledge of the capabilities and management of soils, of stock of all kinds, and of machinery; besides which he must also be a handy man, able to do a little carpentry and blacksmithing. Added to all this he must be energetic and persevering. The young man of the present day stands a much better chance than his father, as he can obtain reliable advice and instruction on almost all matters connected with his operations; whereas his father had to grope his way, and learn almost all his lessons by costly experience.

PICKLING OATS.—Members wished to know the best method of pickling oats. [Either formalin or hot water treatment will prove effective.—Ed.]

STALLION TAX.—Mr. Robinson initiated a discussion on this subject. He contended that the breed of draught horses was fast deteriorating throughout the country, and attributed this largely to the inferior stallions now used. He strongly favoured a tax on stallions as a means of lessening the number of inferior animals kept. The Chairman and Mr. Way contended that no one had any right to interfere in this matter, and put the deterioration, which they admitted, down to the results of bad seasons.

Boothby, June 26.

PRESENT—Messrs. Whyte (chair), Chaplin, Henderson, Carn, Sims, Leonard, McGown, and one visitor.

SEED DRILLS.—A discussion took place on the relative merits of the hoe and disc drills, members unanimously favouring the disc drill as specially suited to the requirement of scrub land. Mr. Sims advocated harrowing after drilling in seed, as it gave the seed a firmer bed, and destroyed any weeds that may have started. Members generally preferred to leave the ground undisturbed after the drill.

RED RUST.—Some discussion on this subject took place. Mr. Leonard thought, in view of the losses from rust, the Government should offer a substantial reward for the discovery of some preventive. [Rewards have been offered in past years without success. The success achieved in the growing of wheats resistant to rust has rendered it unnecessary for such action now.—Ed.] The Chairman thought that, while much had been done in the development of rust-resistant wheats, there was still much work for the experimentalist in this matter. Reference was made to the fact that rust did not appear to flourish in certain districts.

Cradock, June 15.

PRESENT—Messrs. Paterson (chair), Gillick, Solly, McAuly, Marsh, Garnet, Graham, Glasson, and Lindo (Hon. Sec.).

BAGS AS WHEAT.—Mr. Symons forwarded short paper on this subject. He viewed with regret the adoption by the Farmers' Union of the practice of buying wheat, bags in, and believed it would result in alienating the sympathies of the farmers. He thought, in view of past experiences, the farmers as a body should support the Union, and at the same time induce the Directors to adopt a more equitable practice. He thought the old system was unfair to the merchant: but the farmer was unjustly treated now. He thought the fairest way would be to sell the wheat at nett, and for the merchant to allow the farmer half the value of the bag. This suggestion was generally approved. Mr. Graham said the buyer, while buying the bag as wheat at 1½d. per bag, deducted 2d. for every secondhand bag used by the farmer.

TESTING WEIGHT OF WHEAT.—The present system of testing the weight of the bushel of wheat by means of a half-pound sample was strongly criticised. Members considered that the measure for testing should have a capacity of at least 10 lb.

Inkerman, June 28.

PRESENT—Messrs. C. H. Daniel (chair), Board, D. and W. Fraser, Kennedy, Williams, Sampson, F. J. and F. C. Smart, and C. E. Daniel (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed twelve meetings held, with an average attendance of seven members and two visitors. The meetings during the year have been generally of an interesting character. Messrs. R. Kennedy, C. E. Daniel, and F. C. Smart were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year, the retiring officers being thanked for their services.

Petina, June 25.

PRESENT—Messrs. Penna (chair), Talbot, Giles, Wallschutzky, Cocks, Norton, Lutze, Fiddamann (Hon. Sec.), and one visitor.

VETERINARY MEDICINE CHEST.—It was decided to form a homœopathic medicine chest, and to obtain one or two books on veterinary work, in order to enable members to treat their stock for ordinary ailments.

TREE-PLANTING.—Considerable discussion on this subject took place, and it was decided to obtain trees for planting from the Port Lincoln Forest Nursery.

Koolunga, May 26.

PRESENT—Messrs. Butcher (chair), Button, Burgess, Palmer, Sandow, Jose, Atkinson, Fuller, Buchanan, Butterfield, Lawry, Perrin, Cooper, and Noack (Hon. Sec.).

POULTRY.—Mr. R. H. Palmer read a paper on "The Laying Hen." The majority of farmers were interested in egg production rather than the growing of table poultry. There were many reasons for this. Eggs always found a ready market at profitable rates; they were easily disposed of; can be kept for several days under proper conditions without injury; a large value occupies a small space. The result is that in many country districts eggs pass practically as cash. It is true that a few years ago prices in the glut season were so low as to be unprofitable; but this was due to their being bought at such times by speculators, who in most cases made good profits out of them. Now, however, under the stimulus of interstate free trade, there was more active competition amongst the wholesale buyers, and prices were on the whole profitable to the producer. With table poultry more skill and attention were required, besides which they would have to take the risks of the London market, as local prices were not to be relied upon. Generally speaking, the farmer could not depend upon getting adequate prices for first-class table birds. Dealing with egg production, he thought they could, by a little care and attention, considerably improve the laying qualities of their hens. It was not necessary for the farmer to keep pure-bred fowls only; but he would not advise going beyond the first cross, and inbreeding should be avoided. In selecting the breeds, it should be borne in mind that the best spring and summer layers do not, as a rule, excel in winter. Of the former, the Minorca and Leghorn are the best; of the latter, the Wvandotte, Orpington, or Langshan. Another point is that they must see that they get a good laying strain of the breed selected. Care should be exercised in the collection and marketing of eggs. They should be gathered every day, and should be sent to market at least once a week; every three or four days would be better. One alteration was needed in the selling of eggs, and that was the abolition of the ridiculous practice of selling by the dozen instead of by weight. A dozen eggs of some breeds will weigh as much as 15 or 16 eggs of another breed, yet no difference was made in the sale price. It would be just as easy to sell by weight as by count. Members generally favoured selling eggs by weight, but Mr. Sandow feared that the extra handling and bother would reduce the price to producers. It was agreed that "strain" plays a very important part in the selection of fowls for laying. The opinion was also expressed that the present egg-laying competition at Roseworthy would be of no material benefit to the community, owing to no provision having been made for the sale of eggs for breeding purposes.

Willunga, July 2.

PRESENT—Messrs. Pengilly (chair), Blacker, Malpas, Vaudrey, Binney, Valentine, and Hughes (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed a fairly satisfactory attendance throughout the year, with interesting and instructive meetings on the whole. Homestead meetings were held at two of the members' farms. The experiments being conducted by the Chairman, under the control of the Department of Agriculture, are being watched with great interest. The retiring officers were thanked for their services. Messrs. W. Binney, J. S. Malpas, and J. A. Hughes were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Penola, July 9.

PRESENT—Messrs. Darwent (chair), McBain, Miller, Peake, McKay, Stoney, Worthington, and Allnutt (Hon. Sec.).

WAY-BILLING TRAVELLING STOCK.—Suggestions of Mr. Reuman, of Kingston Branch, were discussed at length, but there was considerable difference of opinion as to the wisdom of compelling persons in charge of travelling stock to carry a waybill describing the said stock.

Finniss, July 4.

PRESENT—Messrs. Chibnall (chair), Collett, Cameron, and Henley (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members did not favour Kapunda proposal for a fixed standard of 60 lb., as they consider it would make farmers very careless in cleaning their wheat. They would prefer fixing the weight at 63 lb., believing that the higher standard would result in higher prices for South Australian wheat in the London market.

Yorketown, June 11.

PRESENT—Messrs. Correll (chair), Koth, Anderson, Bull, Sabine, Jung, Domaschenz, Lloyd, and Newbold (Hon. Sec.).

GRUBS IN WHEAT CROPS.—The Chairman reported that the underground grubs were again making their presence felt in the wheat on a number of farms, and he feared losses would be serious. Other members had not noticed any damage on their farms in the wheat, though they were plentiful in some parts on newly-cropped land. Various methods, such as rolling with heavy roller, harrowing, heavy dressings of salt, etc., had been tried in previous years without effect. Burning the stubble was believed to be an effective method of checking the pest, as the beetles laid their eggs on or very close to the surface of the ground.

FORMALIN FOR PICKLING WHEAT.—Several members reported having tried this pickle, and they believed that if it proved satisfactory in preventing damage by smut it would soon supersede bluestone. Up to the present the wheat treated with formalin showed much thicker and more vigorous growth than the wheat from seed treated with bluestone.

Carrieton, July 11.

PRESENT—Messrs. Gleeson (chair), Fisher, Kaerger, Hupatz, Davies, Martin, Ormston, and Bock (Hon. Sec.).

STANDARD BUSHEL.—Members generally condemned the proposal of Kapunda Branch for a fixed standard of 60 lb. per bushel. It was held that such a low standard would react very injuriously on the reputation and prices of South Australian wheats in the world's markets. While not agreeing with the way in which the Chamber of Commerce fixed the standard, members considered it would be very unwise to ask Parliament to interfere in the matter. The delay in fixing the standard was strongly condemned, and exception was taken to the small measure used by buyers in testing the weight of wheat. It was resolved that, in the opinion of members, the standard should be fixed not later than December 8, and that the measure used by the buyer should be of not less than 2 lb. capacity.

Elbow Hill, June 28.

PRESENT—Messrs. H. Dunn (chair), Harvey, Pike, Wake, Ward, Wills, and G. C. Dunn (Hon. Sec.), and six visitors.

COST OF WHEAT GROWING.—Messrs. B. Wills and J. Wake read short papers on this subject. Mr. Wills' figures showed a cost of 12s. per acre to plough, harrow, gather stumps, and drill in seed with manure. Mr. Wake's figures for cropping 200 acres amounted to £206; that is, all work from ploughing to cleaning the crop. With a twelve bushel crop at 2s. 6d. per bushel this left a profit of £94.

FRACTURED BONE.—Some discussion on treatment of horse with fractured bone took place. Members thought that unless the animal was aged, or the break very bad, it was not advisable to destroy the horse, as with care the bone would knit together again.

Forster, June 18.

PRESENT.—Messrs. W. Johns (chair) F. and J. Johns, Retallack, Bolt, Sapsfield, A. and E. Schenscher, and five visitors.

PROTECTION OF FARM IMPLEMENTS.—Mr. A. Schenscher read from report of Utera Plains, in June *Journal of Agriculture*, paper on purchase and protection of farm implements. A good discussion ensued, most of the members agreeing in the main with the paper. It was decided to hold a field trial of cultivating implements.

STANDARD BUSHEL.—Discussion took place on standard weight of bushel of wheat, which members thought should be fixed at 60 lb.

Morgan, June 25.

PRESENT.—Messrs. Windebank (chair), Hahn, Hewitt, Hausler, Bruhn, Lindner, Pope, R. and H. Wohling (Hon. Sec.), and five visitors.

BRANDING CHAFF.—Considerable discussion took place on the question of the adulteration of chaff, the majority of the members advocating legislation to compel vendors of headed straw chaff or mixed chaff to brand the bags accordingly.

Quorn, May 28.

PRESENT.—Messrs. Noll (chair), Finley, McColl, Patten, Cook, Herde, Rowe, Smith, Toll, Salmon, and Walker (Hon. Sec.).

MANURES.—Members' experience with superphosphate in this district was that it gave best results on sandy loam soils.

NEW IMPLEMENTS.—Mr. Finley reported favourably of a light steel six-furrowed plough, which could also be used as a scarifier or cultivator. It was of light draught and he had worked it with a team of seven horses, three of which were almost ponies. With more strength the plough could be used for fallowing on fairly level country, but for the hills it was hardly strong enough. Mr. Noll reported trial of disc plough on the Boolecunda Swamp, on land so infested with "hog weed" and other rubbish as to make it impossible to use an ordinary plough. The disc plough turned the rubbish under well, and did its work to the satisfaction of those farmers who attended the trial. He thought the plough a perfect implement for the plains, but was doubtful of its value for rough land in the hills. Members were agreed that it was necessary for farmers to test these new implements, as it was not profitable to use anything that was obsolete, or which had been improved on in order to lighten the draught, while doing as good or better work.

Nantawarra, June 22.

PRESENT.—Messrs. Dixon (chair), Dall, E. J. and H. F. Herbert, Pridham, Rattew, Greenshields, and Nicholls (Hon. Sec.), and two visitors.

OFFICERS.—The annual election of officers took place, Messrs. R. Nicholls, C. T. Rattew, and James Nicholls being appointed Chairman, Vice-Chairman, and Hon. Secretary respectively.

STANDARD BUSHEL.—This subject was discussed, and it was resolved that, in the opinion of members, all wheat, whether above or below the so-called standard, should be bought and sold on its merits.

CONCRETE FLOORS.—In reply to question as to best way of building good barn floor, concrete, made as follows, was recommended:—Take equal quantities of good, well-slaked lime and clean, sharp sand; mix thoroughly and place in position. Tamp well, and when small cracks appear upon the damp surface sprinkle lightly with cement and work it in with a plasterer's trowel; then tamp well again.

SIZE OF WHEAT SACK.—Members were opposed to suggested reduction in the size of the wheat sack.

Riverton, June 25.

PRESENT—Messrs. A. J. Davis (chair), Glynn, Gravestocks, Hannaford, Gray, H. A. and W. B. Davis, Caff, Kelly, James, and Cooper (Hon. Sec.).

HON. SECRETARY.—Mr. H. A. Hussey resigned his office, having left the district, and Mr. R. H. Cooper was elected to fill the vacant position.

LIMEWASHING FRUIT TREES.—In reply to question as to the benefit to be derived from applying limewash to the stems of fruit trees, Mr. Gravestocks stated that, in addition to preserving the bark against the effects of the weather, it prevented the spread of mildew and lichen on the trees.

HAWKESBURY AGRICULTURAL COLLEGE.—Mr. H. A. Davis gave an interesting account of a recent visit to the Hawkesbury Agricultural College.

Scales Bay, June 18.

PRESENT—Messrs. Roberts (chair), G. and A. Newbold, and five visitors.

RABBIT DESTRUCTION.—Discussion on this subject took place. Where rabbits burrow under the netting, it has been found a good practice to fill up the holes, and place baits of apple or plum jam mixed with strychnine on stones or pieces of wood near by. The Chairman had known as many as 70 rabbits to take poison laid in this way in one night. This is also found very effective about the burrows.

COLONIAL WOOLLENS.—Members thought that as most farmers now keep sheep, it would be a good idea for farmers and graziers to encourage their employes to wear colonial made tweed and other woollens, to increase the local demand for wool for manufacturing purposes.

Burra, June 17.

PRESENT—Messrs. McDonald (chair), Flower, Dawson, Duldig, Needham, Field, Arnold, Hawkes, and Harvey (Hon. Sec.), and one visitor.

MEMBERSHIP.—Members approved of alterations in rules suggested by Wilmington Branch, except that it was considered undesirable to allow candidates to nominate themselves.

STANDARD BUSHEL.—Members did not approve of petition emanating from Kapunda Branch in favour of a fixed legal standard bushel of 60 lb.

ROUP.—Members wished to know if there was any cure for this complaint in fowls. [Yes. Mr. D. F. Laurie states that affected birds should be isolated in warm, roomy coops, and the nostrils cleaned out thoroughly with a rag or stiff feather, which had previously been dipped in a mixture of equal quantities of eucalyptus and oil. The throat and windpipe should be treated with this mixture, applying it twice a day with a long feather. Severe cases may require further treatment.—Ed.]

POISONING OF STOCK.—Mr. R. J. Needham (Deputy Chief Inspector of Stock) read a paper on the poisoning by food in horses and cattle. So many losses from this cause have come under the notice of the Stock Department of late years, and as these losses continue and even appear to be on the increase, he knew of no subject connected with the stock on the farm which was of more importance to farmers and stockowners. Fodder and stubbles damaged by mould fungus or parasites are the common causes of trouble, and many valuable animals are lost every year. Mould fungus, rust, and smut are micro-organisms or cryptogama, and are numerous, and it is generally thought that the poisonous symptoms are not caused so much by the organisms themselves as by the secretions left by them. The general action of these micro-organisms is to cause paralysis, contraction of the pupil of the eye, great stupor, and often, before death, convulsions. They may remain harmless as long as the animal eating them is in perfect condition: but if, for instance, the horse is stale from hard work, the mucous membrane of the intestines admits their entrance into

the system, and trouble follows. Mouldy grain and forage or all kinds cause a most dangerous enteritis, or gastro-enteritis, in horses and cattle, which often takes a typical form, and is very malignant in cattle. The symptoms of gastro-enteritis in the early stages are not well marked, but as the disease progresses there is constipation and stupor; then there may be diarrhœa, respiration short, coat staring, wasting. The fact of a number of horses being taken ill at once should arouse the fears of the owner. All food should be carefully examined, and the water supply also looked to. The water supply is often the cause of the trouble. He had seen farms where all the drainage of the farmyards, pigsties, etc., got into the dam where the stock are watered; at other places the water troughs are never cleaned out, and are in a most insanitary condition. In the event of an outbreak of this disease the food should be changed immediately. Give carbonate of soda if there is tympany, and antiseptics should be used. If there is partial paralysis, strong nux vomica may be used. But the main thing is prevention. Inferior and damaged food should not be used; tough and hard food, such as "cookie chaff," should be used as little as possible, as it will cause irritation of the bowels, and the infective organisms gain entrance to the system.

Appila-Yarrowie, June 24.

PRESENT—Messrs. Francis (chair), Bottrall, Brinkworth, Catford, Stacey, Wilsden, Bauer, Daly, and Fox (Hon. Sec.).

DEATH OF MR. C. G. F. BAUER.—The death of this gentleman, one of the founders of the Branch, and for many years Hon. Secretary, was referred to, and it was decided to send a letter of condolence to the family.

STANDARD BUSHEL.—Papers on this subject, read at Kapunda and Saddleworth meetings, were discussed, and it was resolved that this Branch is in favour of a fixed standard of 62 lb. Members considered 60 lb., as suggested by Kapunda Branch, altogether too low.

CATTLE COMPLAINT.—Paper read at Port Broughton Branch by Stock Inspector Needham was also discussed.

Arthurton, June 23.

PRESENT—Messrs. Hawke (chair) Rowe, Welch, Pearson, S. and T. Lamshed, Short, and Palm (Hon. Sec.), and several visitors.

SHEEP.—Mr. George Jeffrey gave a very interesting address, dealing with the keeping of sheep by farmers, and the treatment of the wool. Four live sheep were exhibited, and Mr. Jeffrey explained how the respective portions of the fleeces should be dealt with. A vote of thanks was accorded to Mr. Jeffrey for his visit.

MEMBERSHIP.—It was unanimously resolved that it was not desirable to alter the present constitution of the Branch.

Lyndoch, June 23.

PRESENT—Messrs. Kennedy (chair), Reu, Zimmermann, H. and A. Springbett, Rushall, and two honorary members.

MEMBERSHIP.—Members did not consider that Wilmington proposals in reference to membership would be desirable for this Branch to adopt.

PICKLING WHEAT.—Mr. Rushall initiated a discussion on this subject.

FRUITGROWING.—It was decided to suggest for discussion at Congress the subject of bird pests. Mr. H. Springbett tabled oranges showing marks on the skin, which were attributed by members to damage by hail.

Koolunga, June 30.

PRESENT—Messrs. Butcher (chair), Jose, Button, Shipway, Perrin, Fuller, Burgess, and Noack (Hon. Sec.).

STANDARD BUSHEL.—Circular from Kapunda Branch was discussed. Most of the members oppose the proposal to reduce the standard to 60 lb., and it was unanimously resolved that, in the opinion of the Branch, a fixed standard of 62 lb. per bushel should be adopted, with extra payment for wheat over standard.

FORESTRY.—Mr. W. Perrin read a short paper on this subject. He thought tree-planting should be regarded as an important part of farm work in a country so sparsely timbered. Every year the timber on many hundreds of acres was cut down, and very little was done towards replacing it. He thought every landowner should make it his duty to plant a few trees each year. It would also be well if the Government would plant more extensively than in past years, and also protect natural belts of timber on all Crown lands. There was much land in this district which could be profitably utilised as forest reserves, notably the three-chain road, which at present was an eyesore and a waste of good land. A chain road would be sufficient for traffic, and the two-chain strip should be planted. One did not have to travel far in this district to note the effect of a few trees about the homestead. A few clumps of trees in the corners of the paddocks added materially to the value and to the appearance of the farm. They provided much needed shelter for stock, which will keep in better condition than in shelterless fields. He was also inclined to agree with those who held that the removal of so much timber from the agricultural areas had much to do with the decreased rainfall. Mr. Shipway considered it a bad practice to plant large growing trees too near the house, while Mr. Butcher condemned the planting of trees in the corners of paddocks, as they were of little value there for shade, and stock under or about them interfered with the fences. Mr. Burgess thought that they often loosened up the soil too much when planting trees. It would be better if the ground was left firmer.

Virginia, June 27.

PRESENT—Messrs. Hatcher (chair), J. E. and S. J. Taylor, Nash, White, J. E. and D. J. Sheedy, Huxtable, Pavy, Strempel, Thompson, Odgers, Baker, and Ryan (Hon. Sec.).

SEEDING.—Mr. D. J. Sheedy read a paper on this subject. The land should be fallowed wet in July and August. The after working was best done with chisel-tined harrows, as they made a better seedbed than the scarifier. He believed the new cultivators did good work, but had but little experience of it. The object of their work should be to have the fallow land clean, with a good tilth and firm seedbed. He believed in drilling in the seed and manure together, and would drill as shallow as possible. When sowing early wheats he would apply $1\frac{1}{2}$ bushels per acre; for later sowing 75 lb. per acre. One bushel per acre of barley was sufficient, as it did not do well if sown too thick. He thought all farmers should sow some early wheat. Neumann's had done very well with him for hay, though bad for reaping. Marshall's No. 3 was a good all-round wheat. Bluey, or Dart's Imperial, was badly rusted last year, but previously had done well. He would grow some barley and oats each year. It gave a change to the land and provided good feed. He always pickled his wheat in bluestone solution, and never had any trouble with smut. One pound of bluestone dissolved in $2\frac{1}{2}$ to 3 gallons of water was sufficient for three bags of seed. Barley will stand heavier pickling. He found no difference in the results from imported and local superphosphate, while with the latter they got sound bags and dry manure, two very important advantages. He strongly advised farmers to use local made manure. He considered guano super the cheapest manure for this district, though bone super was perhaps the best. If they were used alternately the farmer would keep his land in better condition than if mineral super was always used. Some discussion took place on formalin for pickling wheat. Messrs. Baker and Taylor reported that wheat kept for a few weeks after pickling with formalin did not germinate well, and they advised caution in its use. Mr. White stated that he had this year sown wheat pickled with bluestone twelve months ago, and it had germinated just as freely as newly pickled wheat.

Angaston, June 25.

PRESENT—Messrs. Snell (chair), Player, F. and A. Salter, Smith, Radford, Trimmer, Vaughan, Sibley, Friend, and Matthews (Hon. Sec.), and two visitors.

CO-OPERATION FOR FRUITGROWERS.—Mr. J. E. Swann, honorary member, read a paper on "Co-operation of Angaston Fruitgrowers." This question had been frequently discussed, but for various reasons nothing practical had resulted. The most curious and at the same time most frequent reason given for failure had been that Angaston growers never did and never would agree to co-operate. He had lived for twenty-four years amongst the growers, and could not understand such a statement. He had watched the steady and prosperous development of the fruit and vinegrowing industry, and had noted the manly way in which growers assisted one another in imparting information on all matters connected with the industry. So far as the growing of fruit was concerned he could not see where they could co-operate further, but in the marketing and selling of the produce every one seemed to go his own way, often to the detriment of the other growers. No one would question that they could grow fruit here equal in quality to that grown in any other part of Australia, yet in the matter of uniformity of sample and general get-up of the produce they were woefully behind the best. In this direction he believed co-operation would do much for the grower, and largely help to bring about better results, and to make the products of the district well known for their quality. Growers should do their best to produce the finest quality fruit. Nothing should be neglected that would help to keep it clean and free from disease. Ample provision should be made in advance for trays, cases, etc., so that the fruit can be handled in the best of condition. Shortage of trays or cases means that in order to prevent the fruit from wasting some is picked immature and some too ripe. This materially reduces the general standard of the marketable article. Then they were behind the times in the matter of packing and grading. Take the matter of dried fruits. Were they put on the market as they should be? Was it not true also that much of the fresh fruit was sent to market in dirty, stained, secondhand boxes, and sometimes the harder fruits in secondhand manure sacks? Their aim should be to have a uniform package for all Angaston fruit, which should be neatly and carefully packed, and the first grade always labelled as Angaston produce. Second or third grade stuff should never be sold as Angaston fruit, or at least branded second grade or third grade. If this were done it would give confidence to the buyer, and co-operation was necessary to bring it about. As a rule, the growers were too busy to give these matters of detail the attention required at the right time, besides which, if the individual undertook the grading, it would be found that each had different ideas on the subject. The only point on which there would be unanimity would be the firm conviction of each that his fruit was equal to if not a little better than his neighbour's. With a co-operative association the fruit would be graded and packed by a competent man, resulting in uniform samples, which could always be supplied in quantity. Then in reference to markets, his opinion was that growers were usually too hasty, the general practice being to sell before they had the fruit ready. This resulted in prices being forced down. The merchants practically fixed their own prices for produce. This should not be allowed. In reference to currants they had an illustration this year of the benefits of co-operation, 3d. per lb. more being secured than the merchants offered. He believed if the growers had held out for 4d. per lb. they would have secured it, and at the same time given a better tone to the market. An association would also deal as direct as possible with the consumers. He now came to the financial question and the matter of management, and had two schemes. The first would be co-operation for the handling of produce. He estimated a capital of £3,000 necessary, as they must have a central building or depot, where all kinds of fruit would be received, graded, and packed in the best manner possible, all cases being branded as containing the goods of the Angaston Co-operative Society. They would also deal with the export of fresh and dried fruit, the evaporation of windfalls and summer apples, the purchase and supply of cases, trays, etc., fixing price and standard of the various grades of fruit, and disposing of them in the best manner possible. They would require a working manager, a clerk permanently, and would engage such labour as necessary from time to time. Some of the capital would require to be utilised as advances to members, not to exceed half the value of their fruit, until it was marketed. The alternative scheme would be to purchase a local storekeeping business in addition, with a view to also sup-

plying the needs of the shareholders. This would require more capital, £5,000 in all, as they must pay more for a capable manager and also buy the stock. This would be an advantage in one way, in that the management would be cheaper in the end, as the manager's time would be occupied throughout the year, and the store hands could be utilised to a large extent in getting up and executing orders received. The store being a purchasing power would bring them into quicker and better touch with the markets. Often merchants would give the Society the preference in buying if they knew that a large proportion at least would be paid by contra account instead of cash, whereas the private grower's requirements would not be worth considering. The Society would purchase for its members at lowest prices cases, trays, wire, manure, and other requisites, apart from the ordinary storekeepers' supplies. Considerable discussion ensued. Members agreed that, given a competent manager, a sound, practical board of management, and the hearty co-operation of all the growers, Mr. Swann's scheme was assured of success. [We hope that the Branch gave something more than mere platonic support to this scheme. The next step should be to put it on a practical footing by forming a committee to push it.—Ed.]

Hawker, June 25.

PRESENT. Messrs. Wardle (chair), A. C. and F. C. Hirsch, Moller, Pumpa, Schluppan, Shanahan, Iredell, and Smith (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—A discussion on the standard weight of wheat took place. Mr. A. C. Hirsch said he had always advocated a high standard, believing that they would consequently receive better value for their wheat than with a low standard; but the experience of late years had convinced him that a high standard simply gave the wheatbuyer power to deal unfairly with the farmer in the matter of docking. He would therefore advocate a fixed standard of 60 lb. to the bushel. Mr. Wardle thought a low standard would mean lower prices. Mr. F. C. Hirsch was sure that farmers could get over this difficulty by joining the Farmers' Union, which would then be in a position to grade the wheat, and sell according to sample. This could be done, whether the wheat was sold locally or shipped to England. A motion that all farmers should become shareholders in the Farmers' Union and dispose of the bulk of their wheat through the Union was carried.

MEMBERSHIP.—It was resolved to support the Wilmington Branch proposals in respect to alterations in membership rules.

Mannum, May 16.

PRESENT.—Messrs. Preiss (chair), Schulze, Fachrmann, Wilhelm, Haby, Lenger, R. P. and J. L. Scott (Hon. Sec.).

SOIL ANALYSES.—Considerable discussion took place on recent articles in *Journal of Agriculture* on recent soil analyses. Members were considerably interested in the figures given, and would like to see similar tests of local soils, though several thought, with the deep soils of the Murray Flats, it would be advisable to take samples to a greater depth than one foot.

Wepowie, June 21.

PRESENT.—Messrs. Gray (chair), T. and R. Gale, Chrystal, McNamara, Hanna, Orrock, Bishop, and Halliday (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary reported an average attendance of just over seven members. Officers were thanked and re-elected.

AGRICULTURAL IMPLEMENTS.—Mr. Halliday read a paper on progress of agricultural implements. One member thought a three-furrow plough quite large enough. With more shares the plough was too long, and did not do its work properly; besides, it required more horses than most drivers could properly manage.

Mount Bryan East, June 25.

PRESENT—Messrs. Dunstan (chair), Quinn, Teddy, Dare, Thomas, Pohner, and Wilks (Hon. Sec.), and several visitors.

RABBIT DESTRUCTION.—Mr. J. Thomas read a paper on this subject, describing first the spread of the rabbits throughout the country, and the methods at first adopted to cope with them, leading up to the general use of wire netting as a means of protecting the land against an invasion of unnetted areas. Strychnine on sandalwood was the first poison used with any general success. This had now been largely replaced by phosphorised poliard. He preferred $1\frac{1}{2}$ in. netting to $1\frac{1}{4}$ in. for fences, as the very small rabbits would get through the latter. Wire-netted traps, similar to those illustrated in the June *Journal of Agriculture*, inside and outside the fence, were useful in dealing with any rabbits travelling along the fence. The fences require occasional inspection and attention, or they may fail to serve the purpose for which they were erected. Probably owing to the early season he had never known the rabbits to be so numerous at this season of the year, especially in the district east of Mount Bryan.

PETATZ SURPRISE WHEAT.—Mr. Quinn tabled sample of this wheat, weighing 70 lb. to the bushel; the crop yielded three bags per acre from broadcast sowing.

Kanmantoo, June 24.

PRESENT—Messrs. Hair (chair), Mullins, Lewis, O'Neill, Theile, R. and J. Downing (Hon. Sec.).

MANURES.—The reading of an early article by Professor Lowrie on this subject caused some discussion. The contentions of the Professor agree almost entirely with the late experiences of members in the use of manures.

HORSE COMPLAINT.—Mr. Mullins reported loss of valuable blood colt from a severe attack of inflammation of the lungs following an attack of strangles, which had not been properly treated. Members generally were apt to look on strangles as a complaint that required little attention; but experience had proved that, if neglected, it might be followed by more serious complaints. They thought it would pay better to adopt the proved treatment in the first case than to risk the loss of the horse.

Waikerie, July 2.

PRESENT—Messrs. Rowe (chair), Jones, Burrows, Allen, Blizzard, Lewis, Pickering, Jaeschke, Starr, Rogers, Wood, and Green (Hon. Sec.), and six visitors.

POTATO EXPERIMENTS.—Mr. Blizzard read a short paper dealing with some experiments with manures for potatoes. In his opinion it was not profitable to grow potatoes on their sandy soils without heavily manuring the land. They could not get sufficient stable manure to dress more than a small area, and must, of necessity, resort to commercial fertilisers. As they must depend almost entirely on irrigation, he thought the fertilisers better than stable manure for two reasons: they were not so heating, and consequently the land required less moisture; economy of distribution. He recently dug a small crop of potatoes put in at the end of January. The land was two-fifths of an acre in area, and was well flooded. One ton per acre of wood ashes was spread on the land, and the setts then ploughed in about five inches deep. Superphosphate at the rate of $3\frac{1}{2}$ cwt. per acre was applied in every third furrow, and the land then harrowed. When the plants were showing well above ground he top dressed with nitrate of soda, hoeing it in. Similar applications were made twice afterwards at intervals of one month, making 2 cwt. per acre in all. The crop was dug in the beginning of June, and the results were not very satisfactory. The seed potatoes cost 15s. 6d., super 7s. 8d., nitrate of soda 12s. 4d., water (one flooding and three irrigations) 18s. 9d. The crop dug totalled only 14 cwt. of marketable potatoes.

Port Pirie, June 25.

PRESENT.—Messrs. Wright (chair), Hector, Johns, Teague, Jose, Bell, Morish, Spain, Humphris, and Wilson (Hon. Sec.).

STANDARD BUSHEL.—Mr. Morrish took exception to statement in report of previous meeting that "all members agreed that a higher price should be paid for wheat going over the standard." He contended that the farmer under the present system was paid more for his heavier wheat, but the Chairman pointed out that while wheat that just reached the standard would contain a lot of rubbish, and yet be paid full market rates, no inducement was offered to the farmer to clean his wheat thoroughly.

HORSE COMPLAINT.—Mr. Johns reported having put his horses on his wheat crops for two days. They were then worked for a day and a half, and during the following night one of the mares slipped her foal. Mr. Humphris said his experience had been similar, and he was convinced that it was a risky practice. Although constant work would not hurt an in-foal mare, it was risky to spell her and then put her into work again before toaling. Paper read by Stock Inspector Needham on impaction was discussed, members stating that his contention that it was largely due to soil exhaustion had been borne out by their experience.

FARM HOME BOOKSHELF.—Professor Towar's article on this subject was discussed, and it was agreed that it would be advisable to establish a Bureau Library. The Hon. Secretary was instructed to make enquiries *re* same.

SIZE OF WHEATSACKS.—The proposal to reduce the size of the wheatsack was generally condemned.

WEANING FOALS.—Members considered it immaterial at what age foals were weaned, provided they were then well fed, and a substitute for the mare's milk given them.

Tatiara, June 25.

PRESENT.—Messrs. Fisher (chair), Stanton, Wiese, Smith, Hughes, and Bond (Hon. Sec.).

STANDARD SAMPLE.—Mr. Smith initiated a discussion on this subject, condemning the present system of selling wheat, as prejudicial to the best interests of the farmer. Members favoured the abolition of the present system of fixing a standard for each season, and in lieu thereof would advocate wheat being graded and sold according to quality, or else the adoption of a fixed standard of 60 lb.

WEIGHT OF MANURES.—In reply to question, the Chairman stated that he had weighed his purchases of manures this year, and found the weights satisfactory.

Davenport, June 16.

PRESENT.—Messrs. Trembath (chair), Hewitson, Roberts, Pybus, Holdsworth, Hodshon, Tickle, and Lecky (Hon. Sec.), and five visitors.

HOMESTEAD MEETING.—Members met at the residence of Mr. W. Hodshon, sen., and spent the afternoon in inspecting the surroundings. Vines, fruit trees of various descriptions, and a splendid assortment of vegetables were found to be in a thriving condition generally. Particular interest was taken in a patch of sand drift, half an acre in extent, which had been sown with lucerne. The lucerne had fully conquered the drift, having grown through nearly 2 ft. of sand before it succeeded in holding it. Water for irrigation is conveyed by pipes all through the garden. During the inspection Mr. Hodshon explained matters connected with the treatment of the land, and also showed how he pruned the different trees and vines. The visitors were afterwards entertained by Mr. and Mrs. Hodshon, who were thanked for their hospitality.

POULTRY FOR PROFIT.—In the evening Mr. F. B. Rathbone read a paper on "Poultry Farming from a Commercial Aspect." This was published in the July issue of *The Journal of Agriculture*.

Kingston, June 4.

PRESENT—Messrs. Wight (chair), Goode, McCulloch, Tapfield, Clarke, McBain, Lloyd, Fraser, Barnet, Pinches, T. and V. Redman (Hon. Sec.).

PASTURE GRASSES.—Some discussion on this subject took place. The Chairman was of opinion that the sowing of land to grass would be one of the features of the future in stock-keeping, as the carrying capacity of the land would be multiplied several times. Some reference was made to *Paspalum dilatatum*, but it was thought this grass was more suited to a warmer locality, the cold in this district being too severe.

SMALL HOLDINGS.—Mr. Lloyd initiated a discussion on this subject, and quoted figures to show that on thirty acres of land a man could support a family. In his scheme two acres were apportioned for the production of bread, 10 acres for meat, 1 acre for vegetables, 3 acres to milk and butter, 1 each for the horse, pigs, poultry, fruit garden, and homestead, 3 acres to wood in the shape of wattles, and 7 acres to the production of produce for sale. A man on a thirty-acre block worked in this way would be much better off, and his family would be brought up under better and healthier conditions than if earning a precarious £1 to £1 10s. per week in the towns. In support of his figures he stated that he had made a profit of £43 from 2½ acres in four months. Members generally thought some men with land of good quality might make a living off a block of land in the way described, but only in rare instances. The Chairman mentioned that for several months he had kept seven head of large stock on little else but the lucerne cut from a plot of three-quarters of an acre.

Gladstone, July 2.

PRESENT—Messrs. Sargent (chair), Goode, Gallasch, Rundle, Greig, Burton, Brayley, Smith, and Wornum (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed ten meetings held, with an average attendance of eight members, while the work of the Branch had been fairly satisfactory. The attendance of members had been very irregular, and he hoped that this would not be the case in future. Six papers were read by members, a public lecture by Professor Towar arranged, and the annual Conference of Northern Branches held. The retiring officers were thanked for their services. Messrs. C. Goode, W. H. Brayley, and W. A. Wornum were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

STANDARD BUSHEL.—Mr. C. Goode read a short paper on this subject. He urged the necessity for caution in respect to the proposal to fix the standard so low as 60 lb., as, in his opinion, such action would be detrimental to the best interests of the farmers.

Clare, June 24.

PRESENT—Messrs. W. S. Birks (chair), A. P. Birks, Christison, Kelly, Carter, McCarthy, Hague, Martin, Knappstein, Bray, and Greenway (Hon. Sec.), and a number of visitors.

FRUITGROWERS' ASSOCIATION.—After formal business was disposed of, Messrs. G. R. Laffer and W. L. Summers urged the claims of the South Australian Fruitgrowers' Association to the support of the fruitgrowers generally. They pointed out that the Association was formed to protect the interests of the growers in ways which could not be accomplished by individual growers. Matters connected with the fruit industry had reached such a stage that it was imperative that better treatment be secured from the shipping companies, both as to freights and to conditions in the bills of lading. In many other directions united action was necessary. Several gentlemen referred to matters in which the fruitgrowers were unfairly treated, and supported the Association. A resolution favouring the establishment of a branch of the Fruitgrowers' Association at Clare was carried unanimously, and the names of 28 members handed in. A committee of five was appointed to canvass the district for support.

Strathalbyn, June 27.

PRESENT—Messrs. M. Rankine (chair), W. M. Rankine, Reed, McAnaney, Butler, Cockburn, Tucker, and Cheriton (Hon. Sec.), and one visitor.

MEMBERSHIP.—Resolutions from Wilmington Branch were discussed, and generally the proposed alterations were approved.

ANNUAL REPORT.—The Hon. Secretary's report showed nine meetings held, with an average attendance of 7.5 members; four papers had been read and discussed, and in addition the papers read at Congress were all discussed. While he was not satisfied with the results of their work, he believed some good had resulted, and he hoped for better work in the future. The Chairman and Hon. Secretary were thanked for their services, and re-elected.

IMPROVEMENT OF PASTURE LANDS.—The Hon. Secretary read a short paper on this subject. He thought this matter had not received the attention it deserved at the Bureau meetings. Almost every subject connected with agricultural operations had been dealt with frequently, and he thought the publicity given to such discussions had been the means of creating and fostering a desire to adopt the most up-to-date and profitable methods of utilising their lands. At the same time the pasture lands had been sadly neglected, under the impression, no doubt, that the droppings from stock grazing on the land improved it. This, however, was not so, as every pound of meat or butter or other product taken off the farm removed some fertilising constituents from the land. It would be a serious calamity if their grass lands were allowed to deteriorate, as he considered them an important factor in the farmer's success. All of them would have noticed the large bunches of coarse grass growing out of the heaps of animal droppings in various parts of the paddocks, more especially where the cows stand about, and near the entrance and exit to the paddock. He strongly advised that these "cow cakes" should be collected at the end of the summer and spread where there is higher grass than in other parts, as the quantity of grass remaining indicates that the stock do not care for it. Manuring would probably improve the quality of this grass. As soon as sufficient rain falls to soften the manure the harrows should be run over the ground upside down. If this were done they would find the paddock generally more even in the production of herbage, and there would be no unsightly bunches of coarse stuff. All the manure that can be gathered from the stables, yards, etc., should be spread on the grass land and harrowed in with heavy harrows; after a few days go over the ground with a roller. If there is not sufficient manure to go over the whole of the grass land, supplement it with commercial fertilisers. Two years ago he carried out some tests for the Department of Agriculture, and was thoroughly satisfied with the results. The manure was broadcasted at the rate of 1 cwt. per acre, harrowed in with heavy harrows, and rolled with heavy roller some weeks after. The season was very dry, and when he cut the grass for ensilage he could not see that the manure had been of much benefit, but soon after nice rain fell, and he got a splendid second growth. Not only was there better growth on the manured land, but the cows preferred it, eating it down very close. The next season he manured 20 acres, applying the manure with a disc drill, setting the discs to cut about 2 in. deep, but letting the manure fall direct from the box to distribute it evenly. The land was afterwards harrowed and rolled, and the results were again very encouraging. At the end of September he cut some of the growth for ensilage, and also made about 15 tons of grass hay, which the cows were very fond of. He was satisfied that the grass was greatly improved by the manure, and he strongly advised farmers to test the value of the practice for themselves.

Crystal Brook, June 18.

PRESENT—Messrs. R. Pavy (chair), Hamlyn, M. and B. Weston, Venning, Davidson, Hutchison, Dabinett, Morrish, Miell, and Symons (Hon. Sec.).

STANDARD BUSHEL.—Mr. W. Morrish read a paper on this subject. He contended that, as the Imperial bushel weighed 60 lb., the standard bushel should be the same. The members generally strongly opposed this idea, being agreed that a sample of South Australian wheat weighing only 60 lb. to the bushel would be very inferior.

Kingston, July 2.

PRESENT—Messrs. Wight (chair), T. Redman, Clarke, Fraser, Lloyd, Barnett, McBain, and V. Redman (Hon. Sec.).

HARDY CATALPA.—The Chairman read Mr. W. Gill's article from *The Journal of Agriculture* on the hardy catalpa. It was resolved to obtain seeds of this tree for trial.

PRIZE FOR SHEEP.—This Branch offered a prize at recent Kingston Show for five sheep most suitable to the requirements of this district, but it was not awarded. It was decided to offer at next show a prize for best three two-tooth strong-woolled Merino sheep, bred by the exhibitor within thirty-five miles of Kingston.

Port Lincoln, July 16.

PRESENT—Messrs. Laidlaw (chair), Bruce, Chapman, Sage, Puckridge, O'Shanahan, and Dr. Kinmont (Hon. Sec.).

OFFICERS AND BUSINESS.—Messrs. W. Laidlaw and E. M. Sage were elected Chairman and Hon. Secretary respectively for ensuing year. It was decided that the rule *re non-attendance* of members be strictly enforced in the future.

Mannum, July 9.

PRESENT—Messrs. Preiss (chair), Wilhelm, Dickson, Lenger, Faehrmann, Schulze, Pfeiffer, R. P. and J. L. Scott (Hon. Sec.), and three visitors.

OFFICERS.—Messrs. A. Faehrmann and J. G. Preiss were elected Chairman and Hon. Secretary respectively for ensuing year.

GRADING WHEAT.—Mr. J. A. Schulze read a paper on this subject. As wheat under the standard weight was severely docked by the buyers, it was necessary for farmers to pay more attention to the cleaning of their wheat. Most of their wheat was simply put through the winnower before being bagged, and there was always a certain amount of impurities, such as small grain, chaff, whitecoats, etc., left in it. This would have to be remedied. There was no necessity for the small farmer to purchase a grader at a cost of £30, as he could easily adapt the ordinary winnower to do what was required. The shaking bar on the left side of the fans should be removed, so that when turning the handle only the fans work. All the sieves should be taken out, and a piece of strong tin or galvanized iron, 6 in. or 8 in. in width, according to the size of the winnower, fixed at the top of the sieve box or shaker. This is to carry the wheat further back before allowing it to drop. See that the machine is standing straight. Then run the wheat through steadily. The current of air is made strong or weak according to requirements, and will carry nearly all the light grain and other impurities away. It would be better for the farmer if all wheat was bought according to quality, as was done in America; but until this system was adopted he should try to make the best of his produce. Members generally favoured the cleaning of wheat in the manner suggested.

Bowhill, June 25.

PRESENT—Messrs. Norman (chair), Weyland, Waters, Johnson, Burton, Kildea, and Whitfield (Hon. Sec.), and two visitors.

MICE.—Members reported mice to be very numerous and destructive throughout the district.

CUTTING MALLEE SHOOTS.—Members were agreed that the best time to cut mallee shoots was during January and February, as the work was more likely to be effective when the sap was up.

OFFICERS.—Messrs. A. R. Dohnt, E. P. Weyland, and J. T. Kildea were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Maitland, July 2.

PRESENT—Messrs. Bowey (chair), Jarrett, Treasure, Bawden, Kelly, Hill, Lamshed, Heinrich, Bowman, Moody, and Tossell (Hon. Sec.).

STANDARD BUSHEL.—This question was further discussed, and it was unanimously agreed to support the Kapunda Branch proposal to ask Parliament to fix a permanent standard. Members consider that the merchants treat the farmers very unfairly in this matter, and do not consider any interests but their own, especially in the matter of docking for samples under standard, and at the same time refusing to pay anything extra for wheat over standard.

CORNSACKS.—A long discussion took place on the question of purchasing cornsacks. It was the opinion of members that it was to every farmer's interest to buy through the Farmers' Union, and it was decided to ask for a quotation for sixty bales.

Mount Pleasant, July 7.

PRESENT—Messrs. Lyddon (chair), Giles, Miller, and Vigar (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that nine meetings had been held during the year, with an average attendance of eight members.

PRIVATE SEPARATOR V. FACTORY.—A short discussion on this subject took place. Mr. Miller did not think they should encourage the use of hand separators, as it was impossible to secure uniform quality in butter with cream from all parts of the State and in varying condition.

MARKETING DAIRY PRODUCE.—One of the members thought that an enquiry into the manner in which dairy produce was disposed of in Adelaide would do a lot of good. He considered he had been unfairly treated by some city firms.

Eudunda, June 27.

PRESENT—Messrs. Krummel (chair), Paech, E. T., J. A., and J. Pfitzner, Schwarz, Schiller, Kluske, Walter, and Weil.

STANDARD BUSHEL.—Petition from Kapunda Branch was discussed at length. Members were of opinion that there should be two grades—No. 2, weighing 60 lb. per bushel; and No. 1, higher in quality. Members also considered that docking should not be allowed on any samples over 60 lb. per bushel.

ROPE FROM BINDER TWINE.—Mr. J. Pfitzner tabled sample of rope made by himself from waste binder twine.

Richman's Creek, June 27.

PRESENT—Messrs. Freebairn (chair), F. H. and J. H. Lehmann, Nicholson, Knox, J. and J. S. McSkimming, Gebert, A. and J. M. Kelly (Hon. Sec.), and one visitor.

WATER CONSERVATION.—Paper read by Mr. Gebert at previous meeting was discussed, and his ideas met with general support. Attention was directed to localities in this district where good results had been achieved by utilising the surplus waters in flooding available areas of land.

POULTRY.—Mr. Gebert read a paper on "Does it Pay to keep Poultry on the Farm." He contended that with a little attention poultry paid well. A good laying strain was necessary, and efforts should be made to improve this. The simplest way for the farmer was to pen up the hens that laid in the winter and mate them with a good rooster of whatever breed was selected. He preferred the crossbred fowls to purebreds. All poor layers and unprofitable birds should be disposed of. Early chicks should be raised, and the fowls got rid of before they get too old. Regular feeding, vermin-proof houses, clean water, and attention to cleanliness were essential. Under these conditions the fowls would give 6s. 6d. to 7s. per bushel for all wheat consumed by them. Skim milk would be found very useful in the feeding.

Denial Bay, June 25.

PRESENT—Messrs. Smith (chair), McKenzie, Starling, Hoffrichter, Croker, Dunnett, and Gale (Hon. Sec.).

RABBIT DESTRUCTION.—Mr. Croker advocated vigorous efforts to destroy rabbits during the dry season, as they would take baits more readily then. All burrows inside netting fences should be kept closed. One member favoured bisulphide of carbon for destroying rabbits in burrows; wire-net sleeve traps were considered effective; poisoning with phosphorised pollard had been proved very effective. Members generally considered that as the iguana was a great enemy of rabbits it should be protected in rabbit-infested districts.

SEASON.—Mr. McKenzie reported that, owing to the adverse season, 2,000 acres of his wheat would be a total failure.

Lucindale, July 16.

PRESENT—Messrs. Tavender (chair), McInnes, Matheson, Williams, Dow, Carmichael, Feuerherdt, and Beaton (Hon. Sec.).

GRASS GRUBS.—Members reported that underground grubs were very numerous and destructive this season.

WEED.—Mr. Williams tabled specimen of trailing plant, which was spreading rapidly, and was not touched by stock. [This is *Linaria elatine*, an exceedingly objectionable weed. It flowers and seeds profusely, and under favourable conditions a single plant will cover a space several feet in width, choking out all useful vegetation.—Ed.]

Morphett Vale, July 19.

PRESENT.—Messrs. Christie (chair), Pocock, Forsyth, Depledge, Perry, McLeod, and Anderson (Hon. Sec.).

POULTRY.—Some discussion on this subject took place. Mr. Forsyth recommended the use of hen turkeys for hatching duck eggs. Mr. McLeod spoke highly of the Minorca-Leghorn cross for laying purposes. Mr. Perry asked how long after the rooster was placed with the hens before the eggs would be fertile. [Although the eggs may be fertile after four days, it is better to wait two or three days longer.—Ed.]

LUCERNE.—In reply to question, one member stated that a neighbour had got a good stand of lucerne by sowing the seed with the hay crop.

WORMS IN PIGS.—The Chairman asked for cure for worms in pigs, and was recommended to give sulphur. [See page 470 of March, 1904, issue, for treatment.—Ed.]

Golden Grove, June 23.

PRESENT—Messrs. Milne (chair), McPharlin, Harper, Angove, Ross, Maughan, Rawlings, White, Madigan, N. J. and A. D. N. Robertson (Hon. Sec.).

QUESTIONS.—As no paper was available for discussion, the Hon. Secretary wrote out eight questions on agricultural subjects. These were placed in a hat and drawn by members in turn. The member had five minutes to speak on his subject, and five minutes were allowed for criticism. This plan proved very successful, and an interesting evening was the result. It was agreed that King's Early, White Tuscan, and Galland's Hybrid wheats were the best three hay wheats for this district. Field peas should be sown about end of May and cross-drilled with about 15 lb. barley per acre; apply 1½ cwt. of bonedust and ½ cwt. super per acre. Cleopatra was regarded as the best all-round apple for this district. Members were divided in the opinion as to the two next best, some favouring Jonathan and Esopus Spitzenburg, and others Dunn's Seedling and Rome Beauty.

Woodside, June 27.

PRESENT—Messrs. Caldwell (chair), Drogenmuller, Lauterbach, Pfeiffer, Fowler, Kleinschmidt, Keddie, Rollbusch, and Hughes (Hon. Sec.).

GATHERING FRUIT.—Mr. W. Rollbusch read a paper on this subject. He thought that the gathering of fruit had not received the consideration at their meetings that its importance warranted. If they wished to market their fruit in the best possible condition it was important that the greatest care should be taken in the gathering. All fruits not for immediate use must be gathered free from bruises, or it will not keep. Growers hold different views as to the best receptacle to pick into: some favour the kerosine bucket, others use a basket, and again others prefer an apron, which, in his opinion, was the best. With a kerosine tin, the fruit first placed in it will roll about with every movement of the picker until the bottom is covered; while the pressure of the fruit on the rough bottom of the ordinary basket also bruises it. An apron is easily made to suit requirements. Take an empty sugarbag, cut it open along the seams, then fold in part of the top corner, and attach a strap to go around the neck. A cord to go around the waist is also necessary. When the apron is put on the bottom corners are turned up, and by means of a nail fastened to the upper corners of the apron, thus forming a bag into which the fruit can be placed with little risk of bruising if it is carefully handled. In order to pick quickly both hands must be used, and if the picker is possessed of a fair share of brains and makes use of his perceptive faculties he soon becomes expert. In picking fruit a pair of steps long enough to reach all the fruit without the necessity for stepping into the tree should be used. When picking plums for the factory they must be stemmed. This is quickly done by catching hold of the stem with thumb and forefinger and drawing the fruit into the hand with the second and third fingers. For other purposes the stems should be left on, and this applies to other fruits, as if the stems are pulled out the fruit will not keep. For marketing, fruit must not be left until too ripe, as it bruises readily, nor should soft and firm fruit be packed in the same case. While some apples are firm and solid, others bruise very readily, especially the large, soft fruits, like Emperor Alexander. In picking apples for keeping the time is generally gauged by taking an average fruit, cutting it open, and examining the seeds. If these are dark the fruit can be safely gathered. Apples varied greatly in the ease with which they were picked. The fruit should be grasped firmly, pressing the thumb or finger on the stem where it joins the fruit spur, and lifted upwards or sideways. If more than one fruit is growing from the same spur both should be grasped at once, otherwise one will probably drop when the other is pulled. Care must be taken that in gathering the fruit the bud on the spur near the stem is not broken off. With varieties that bruise easily too many should not be placed in the apron at once, and they should be handled separately when putting them into cases. One point often overlooked is the grading of the fruit. With very little care this can be done when picking, all of the first grade being picked first and packed by themselves. The smaller fruits can be gathered afterwards. If this is done the grower will get a better average price than if not graded. Pears are usually gathered before they are quite ripe, as most kinds ripen well after picking. Pears must be carefully handled or they will not keep. If the stem is pulled out they quickly decay.

Colton, July 9.

PRESENT—Messrs. P. P. Kevvy (chair), M. S. W. Kenny, Hull, Whitehead, and Packer (Hon. Sec.).

MEETINGS.—Some discussion took place on the question of holding meetings quarterly instead of monthly, on account of the difficulty of getting a good attendance at monthly meetings, but nothing was decided. Members spoke of the help the Bureau had been to them, and regretted that the young men did not take more interest in the work.

CONGRESS.—Members thought Congress meetings started too late in the week. There were so many other meetings during show week that it was impossible for country visitors to attend all they would like. [If Congress meetings commenced on Tuesday morning and finished on Wednesday evening would Bureau members come to town earlier to attend them?—Ed.]

Booleroo Centre, July 18.

PRESENT—Messrs. Clack (chair), Brooks, Nottle, Murdoch, Dr. Steven, and McMartin (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Petition from Kapunda Branch was discussed, but no decision recorded. Members were, however, unanimous that if wheat below the standard was docked, wheat above standard should receive a higher price per bushel.

ANNUAL REPORT.—Seven meetings held during year, with average attendance of 8.5. Two papers had been read and discussed, and various matters of interest dealt with. Messrs. W. Brooks, J. Murdoch, and F. McMartin were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Quorn, June 25.

PRESENT—Messrs. Thompson (chair), Salmon, Noll, Patten, Cook, Smith, McColl, Brewster, Venning, and Walker (Hon. Sec.).

BAGS AS WHEAT.—Mr. Patten initiated a discussion on this subject. He strongly condemned the present system of buying the bags at 6d. each, and selling them as wheat, by which the farmer lost 4½d. on each bag. Most of the members, however, held that the question of bags was necessarily taken into consideration by the buyer when purchasing wheat, and that it would not be to the advantage of the farmer to revert to the old practice of buying wheat at net weight and allowing the farmer the price of the bag.

IMPROVEMENT OF STOCK.—Mr. Salmon urged that the Branch should deal in a practical manner with the question of the improvement of stock.

Riverton, July 3.

PRESENT—Messrs. A. J. Davis (chair), W. Davis, Dr. Glynn, Gray, Hannaford, Malcolm, Gravestock, James, Kelly, and Cooper (Hon. Sec.).

PLUM BORER.—Mr. Gravestock showed cuttings of a plum tree badly bored by some grub. He intended to try bisulphide of carbon in the tunnels.

FALLOWING.—The Hon. Secretary read a short paper on this subject. Some farmers advocated summer fallowing, and though he had not much experience of the practice, he believed that for heavy, dirty land it was beneficial. This land would plough easier when dry, and the oats and other rubbish would get a good start during the winter months, providing good early feed for ration sheep. Fallowing as a general practice was, however, carried out in July and August. On dirty land he knew some farmers who got good results by using the cultivator several times instead of ploughing, the object being to keep the oat seeds near the surface. If ploughed under, the seeds will not germinate until they are again brought near to the surface. This system, however, could only be applied to land that was loose. That previously left out to grass must be ploughed. Most farmers appear to hold the opinion that during the winter months, at any rate, fallow should be left fairly rough. If smooth, there was too much tendency, especially on heavy land, to cake. He would harrow the fallow about a month or six weeks after ploughing, and cultivate in September or October. One cultivation is generally sufficient, as the sheep can be depended upon as a rule to keep the land clean afterwards. With such weather as experienced last summer, it was, however, necessary to cultivate frequently, but at the same time he did not like working the fallow in the hot weather, as it exposes the moist soil to the influence of sun and winds, with the consequent loss of moisture. He believed that in future little else but fallow would be cropped, as they would get quite as much return off a smaller area of land as under present conditions. Messrs. A. J. and W. B. Davis favoured summer fallow, but Mr. Gravestock would plough early. Most members thought the harrows should be used more than they were, but Mr. Malcolm considered that fallow left fairly rough would retain the moisture better than with a smooth surface.

Crystal Brook, July 23

PRESENT—Messrs. Pavy (chair), Hamlyn, Davidson, Weston, and Symons (Hon. Sec.), and two visitors.

ANNUAL REPORT.—Twelve meetings have been held during the year, with an average attendance of nearly eleven members. Eleven papers have been read by members, and a generally successful year has been experienced. Messrs. W. Hamlyn, W. Hutchison, and J. C. Symons were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

STANDARD BUSHEL.—Mr. J. C. Symons read a paper on "A Fixed Standard for Wheat." It must be admitted by all that anything which touches the interests of the producers is of vast importance, as the whole of the State was directly or indirectly interested in the welfare of the agriculturist. South Australia was first and foremost an agricultural State, as the staple exports for 1902 will show:—Wheat and its products, £1,205,000; wool, £782,000; hay and chaff, £481,000; copper, £431,000; hides and skins, £292,000; live stock, £163,000; wine, £125,000; eggs, poultry, etc., £111,000; total, £3,590,000. It will be seen that wheat, hay, chaff, eggs, and poultry, along with a portion of the wool, hides, skins, and live stock, represent over two-thirds of the total exports. The standard for wheat affects all farmers, hence its importance. They naturally enquired: "Were the persons who fix the standard the proper persons to do it?" and the answer was emphatically: "No." The Chamber of Commerce were interested in the buying and selling of wheat for their own profits. If the raising or lowering of the standard would add to those profits the farmer may safely reckon that the standard will rise and fall accordingly. The standard should, he thought, be fixed by two members of the Chamber of Commerce, two representatives of the farming community, with the Secretary for Agriculture as Chairman. But could not the standard of wheat be fixed for all time? He thought it could and should. First, because the farmers of this State may lose in one season many thousands of pounds by a movable standard. Take last season as an illustration. They commenced with the old standard of 63 lb. Three-fifths of the wheat in the North and Middle North was delivered before the new standard was fixed. Frost and red rust had seriously damaged the grain, especially the late crops, so that quite two-fifths of the wheat delivered at Crystal Brook was below 63 lb., and hence was docked from a penny to twopence per bushel, say an average of a penny per bushel. Out of 310,000 bushels delivered at Crystal Brook he thought 123,000 bushels were docked, say an average of a penny, making a loss to the farmers of the district of £500. Working on this basis, it made a total loss to the farmers of the State of £21,000 last year, through a movable standard. The standard, he thought, should be fixed for all time at 62 lb. A 60 lb. or a 61 lb. was not a fair milling wheat for South Australia. In a rusty or blighty season farmers would have to submit to a dock, but in good seasons, when the wheat weighs 64 or 65 lb., the farmer gets the advantage. But while the standard should be fixed for all time at 62 lb. for testing purposes, the wheat would be bought and sold, as now, at 60 lb. per bushel. There need be no clamour for an extra price for extra heavy wheat, as the farmer who delivers 100 bushels of 66-lb. wheat will find on his cartnote 6.40 bushels more than the farmer who delivers the same number of bushels of 62-lb. wheat. Nor need there be any petition signed and sent to Parliament to get merchants to buy wheat at 60 lb. per bushel; they do and always have done so. If wheat be inferior it must be docked; but it need not be docked so heavily, because merchants ship 62, 64, and 59 lb. wheat in the same ship, and sell in London by bulk sample, which would come out above 61½; therefore, as the merchants do not lose so very much they ought not to dock so much.

Strathalbyn, July 25.

PRESENT—Messrs. Rankine (chair), McAnaney, Fischer, Cockburn, and Cheriton (Hon. Sec.).

STANDARD WEIGHT OF WHEAT.—Resolutions from Crystal Brook and Kapunda Branches were discussed, but members did not consider any good would result therefrom, nor was legislative action necessary.

CO-OPERATION.—It was decided to ask the Farmers' Co-operative Union to send up a representative to explain the working, etc., of the Union.

Port Germein, July 2.

PRESENT.—Messrs. Stone (chair), Blessing, Deer, Holman, Gluyas, King-come, Smith, and Basford (Hon. Sec.).

UTILITY OF AGRICULTURAL SHOWS.—Mr. E. G. Blessing read a paper on this subject. He thought every one would admit that the agricultural shows in the capitals of the States had done much good in fostering the agricultural interests, and that the public funds granted as subsidies to these societies had been well spent. It was, however, open to question whether the various country shows had achieved anything to warrant the amount granted annually by the Government for their assistance. He proposed to indicate some of the drawbacks and forms of mismanagement in connection with many of their shows. The appointment of competent judges was of the greatest importance, but his experience was that at country shows the most competent men were often ignored in favour of some wealthy or influential subscriber to the society's funds. It often happens, too, that the appointed judge fails to appear, and the secretary or steward is compelled to hunt amongst those present for some one to take his place, with the natural result that more or less incompetent men undertake these responsible duties. In the machinery section, old well-to-do farmers were usually selected as judges, men whose practical experience dates back to the time when the two-furrow plough and the stripper were the best implements in their respective classes. These men, as he knew for a fact, looked with suspicion on any improvements as "new-fangled notions," and would rather give the prize to machines with which they were familiar. In his opinion, in the machinery and implement class at all shows one at least of the judges should be a mechanic or tradesman. Then there was the want of competition in the stock section at some of the country shows, which pointed to a combination amongst certain breeders not to compete against each other at certain shows. With poultry, it often happened that some exhibits could not arrive until a certain train gets in. The birds are hurried to the ground, and by the time they are staged and judged there is little opportunity for the visitors to see the exhibits. Last year at two shows he visited the exhibitors commenced to remove their exhibits within half an hour of the judges finishing their work. Then, again, the unreasonable conditions attached to some prizes was the cause of lack of competition. They had the Royal Agricultural Society's absurd conditions in connection with Mr. Alick Murray's prize for wheat exhibited at the March Show by Branches of the Bureau. The unreasonable demand that the exhibitor should keep 50 bags of the wheat exhibited resulted in very poor competition, and the prizes going to samples that were not very creditable to South Australia. Had only 10, or even 20, bags been stipulated for, there would, no doubt, have been a much larger number of entries, and these of a higher quality. There would, at any rate, have been one entry from Port Germein, with a sample weighing 3 lb. or 4 lb. per bushel more than the first prize wheat. The number of shows held during the season was another source of weakness. In their own district, between Port Pirie and Petersburg—a distance of less than 60 miles—five shows were held. If three only were held they would be larger and better, more educational, and there would be a considerable saving of expense. It might be said that the societies could spend their money in what way they chose, but where the public funds are thus spent the taxpayer had a right to ask whether the benefits derived warranted the outlay. Members generally supported Mr. Blessing's contentions.

RABBITS.—Discussion on the destruction of rabbits took place.

Port Broughton, July 21.

PRESENT.—Messrs. Harford (chair), W. R. Whittaker, sen., W. R. Whittaker, jun., Button, Tonkin, Hoar, and Dalby (Hon. Sec.).

ANNUAL REPORT.—Nine meetings held, with an average attendance of eight members. Four papers were read during the year. Messrs. J. Tonkin, W. R. Whittaker, sen., and W. J. Dalby were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Minlaton, July 16.

PRESENT—Messrs. Correll (chair), Brown, Martin, Anderson, Boundy, A. and J. McKenzie (Hon. Sec.).

STANDARD BUSHEL.—Motion by Crystal Brook Branch was referred to, but it was decided that, in view of the fact that several Branches had asked that the matter should be discussed at Congress, it was not advisable to deal with it now.

RUGGING COWS.—The Chairman showed a cheap and useful rug for cows, and advocated their use at this season of the year. He was sure that it would also pay to rug the calves in winter.

Saddleworth, July 15.

PRESENT—Messrs. Frost (chair), Bee, Eckermann, Leeder, Plant, Scales, and Coleman (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported attendance for year had averaged only seven, and he trusted that this record would be improved on. Two homestead meetings had been held, several papers read and discussed, and various experiments with wheats, grasses, and manures carried out.

QUESTION BOX.—Various questions were answered. Where two-year-old lucerne was failing to make good growth, it was recommended to apply farm-yard manure and harrow it in at once before the winter rains cease. In feeding working horses members advise giving short feed with oats. Some are sowing alternate strips of land with wheat and oats, so that when the hay is cut and carted it would be mixed ready for chaffing. Some of the members would give long wheat hay at night, but others thought short feed best at all times. In feeding down wheat with sheep, it was considered that less damage would result if sheep were left on the crop during light rains than if mustered and driven out of the paddock when the land was soft.

Mount Bryan East, July 23.

PRESENT—Messrs. Dunstan (chair), Bryce, Teddy, T. and E. Wilks (Hon. Sec.), and one visitor.

LAMB-BREEDING.—A discussion on this subject took place. Members generally favored the purebred merino as the best all-round lamb for this district. Members wished to know the true meaning of the term "comeback sheep." [The term "comeback" is usually applied to the progeny from a Lincoln-merino ewe by a merino ram, but, strictly, it applies to any sheep bred on similar lines. If the sire and grandsire are of the same breed, the progeny is usually spoken of as "three-quarter-bred."—Ed.]

Millicent, July 7.

PRESENT—Messrs. McRostie (chair), Stewart, Hutchesson, Oberlander, Campbell, Stuckey, and Davidson (Hon. Sec.).

STRAWBERRY CLOVER.—Mr. Hutchesson referred to growth of this clover on German Flat. It was stated that one acre covered with the clover would keep a bullock. It stood flooding in winter without injury. Other members had heard favourable reports from other parts of the district.

ANNUAL REPORT.—Ten meetings held, with average attendance of eight members. Messrs. A. McRostie and R. Campbell were elected Chairman and Hon. Secretary respectively.

JUDGING BY POINTS.—Mr. Stewart read extract dealing with judging stock at shows by points. Members thought the system would prove cumbersome and uninteresting to the visitors.

FIRE INSURANCE.—Mr. R. Campbell read a paper. He thought the question of insurance one that the agricultural community might well take up. The

number of companies competing for the fire insurance business, the enormous aggregate of funds held by them, and the dividends paid indicated that they were making a good thing out of it. In almost every small town there were agencies of these companies; the agents received at least 15 per cent. of the premiums, then the companies took a large slice for working expenses, besides what was paid in dividends or carried to credit. In America this question had been taken up by agriculturists, and the small losses showed that the fire risks on farmhouses was not great. The losses of insurance companies were almost entirely on town fires, and the unfortunate insurer in country districts had to pay for these risks. Often they would not insure were it not that the mortgage required it. If the business were taken up on the mutual principle, in all probability they would have in time sufficient funds to take up mortgages on insured properties. There was no reason why such a company could not be made as stable as any other institution. According to *The Fire Insurance Guide* for June, 1902, the aggregate premiums of British offices amounted to £20,600,000 for the year, and the losses to £12,700,000, clearly showing that on the premiums now charged enormous profits were made. No company showed a loss, and the interest on the accumulated funds, in several cases, covered working expenses. Mr. Campbell also read a paper on the middleman, dealing with the evidence elicited by the Victorian Butter Commission.

Rhine Villa, June 24.

PRESENT—Messrs. G. A. Payne (chair), Farey, Schick, Lewis, Mickan, Hecker, and Vigar (Hon. Sec.), and one visitor.

STOCKING PASTURE LAND.—Mr. W. Farey read a paper on this subject. The land in this locality varied very much. On some of it they could keep almost a sheep to the acre, while it would take a hundred acres of some of it to keep a sheep. Fifty years ago this district was mostly stocked with cattle, and there was plenty of saltbush and other natural herbage. Stock went back many miles from water, and there was then no talk of starvation or "impaction." Later on sheep were more largely kept, and in the course of years it was noticed that much of the bush was dying out, while of more recent years the native grasses have shared the same fate. To various causes, such as rabbits and drought, this has been attributed, but he was firmly convinced that it was mainly due to over-stocking. The continuous feeding off of the herbage resulted in destruction of the plant, and they got but scanty new growth after rain. They would always get more new feed if a fair coating of old grass is allowed to remain on the land. This prevents the surface of the soil and the seeds being blown away, and also protects the young plants from the effects of frost and cold winds. On much of their best pasture land the natural grass, as a result of over-stocking, has disappeared, and their place was taken by annual plants, which last but a very short time, and then dry up and are blown away. He considered it advisable to allow the paddocks to be spelled for a short time when the herbage was seeding, and give the land a rest. It would also be a good idea to change the class of stock every few years. Continuous grazing with sheep was very destructive to the pasture unless the greatest care was exercised. He had not seen better examples of how to treat grazing land than those of Messrs. Murray and the late Mr. J. H. Angas.

Forest Range, June 23.

PRESENT—Messrs. Monks (chair), Vickers, Trevenen, Waters, Green, and Hackett.

ANNUAL REPORT.—Eight meetings held: average attendance, nine. Six papers had been read and discussed. Messrs. G. Monks and J. Vickers were elected Chairman and Vice-Chairman respectively, the appointment of Hon. Secretary being deferred.

MEMBERSHIP.—Alterations in membership rules, proposed by Wilmington Branch, did not meet with favour.

Lyndoch, July 21.

PRESENT—Messrs. Kennedy (chair), Ross, Warren, Rushall, Woolcock, Zimmermann, Burge, Mitchell, Reu, Schenke, Kluge, A. H. and E. Springbett (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that twelve meetings had been held during the year, with an average attendance of nine members. Messrs. H. Kennedy, R. Ross, and E. Springbett were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

POULTRY.—Mr. J. Kluge read a paper on "Purebred v. Mongrel or Crossbred Fowls." It was the common idea that mongrel fowls will pay as well, and some say even better, than purebreds. His experience had, however, been just the opposite. The mongrels did not pay as laying birds, and this branch was the only profitable line for the general farmers to take up. It was true that selling birds and eggs for breeding purposes paid all right; but it took considerable experience and some expense to make a success of this branch. Where a person keeps purebred fowls, he can almost always sell a few sittings at an advance on market rates, besides being able to sell a few cockerels at advanced rates. These items would add considerably to the returns. With purebred birds they had eggs and birds of more uniform size, and therefore more likely to find buyers at better prices than mongrels. Purebred fowls cost no more to keep, and were quite as hardy as mongrels. It was true that many condemned purebreds on account of their alleged delicacy, but where this was true it was due to inbreeding. He instanced how this came about. A man would buy a sitting of eggs, and mate the pullets to the best cockerel. This was bad enough, as breeding of brother with sister was the worst form of inbreeding, but it went much further. Some one probably was taken with the fowls, and he followed the example of No. 1: some one else bought from No. 2, and continued the pernicious practice, with the natural result that the birds lost stamina, shape, and all the other desirable qualities in the original stock. Then he also opposed crossbreeding for laying purposes, as they would not improve the laying qualities of the purebred fowls in this way. They could, of course, improve the table qualities, but this would only be at the expense of the laying qualities of the birds. Then, as a matter of beauty, a flock of purebred birds were far superior to any flock of mongrels or crossbreds.

Whyte-Yarcowie, July 16.

PRESENT—Messrs. Hack (chair), Dowd, Hunt, Lock, Mudge, Mitchell, Faul, Jenkins, Makin, McLeod, Francis, Pearce, and Boerke (Hon. Sec.).

ANNUAL REPORT.—Seven meetings held, with an average attendance of 10.7 members. Three papers were read during the year, and altogether the work done had been satisfactory. Messrs. Hack, Dowd, and Boerke were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

HOW TO MAKE FARMING PAY.—Mr. Hunt read a paper on "How to Make Farming Pay in this Locality." This, to his mind, lay in mixed farming. On a farm of 700 to 800 acres there was always room for seven or eight cows, which, without any but natural herbage, should bring in quite £20 per annum, besides sales of calves which were worth rearing. If the cows were hand fed the returns would, of course, be much higher. At least 100 fowls could be easily kept, and they should return a profit of £15 without much trouble, as for nearly three months of the year they will pick up nearly all the food they require. Pigs should also be kept, especially where there were a few cows. He considered no stock gave such immediate profits as three or four breeding sows. On the farm the pigs should not be fed or kept in sties except for six or eight weeks before killing. He found it a good plan to turn a few pigs into the crop if it is too forward. For a number of years he had grown barley for his pigs. He had three small paddocks of about four acres each. On two he sowed barley, and the other was in fallow. He turned the pigs into one lot of barley, and kept the other for grain. The paddocks were, of course, netted. He had kept 10 to 15 pigs on one of these paddocks of green barley for three months, without any other food. A few sheep should also be kept, to provide meat for the farm, and also to bring in a certain revenue. Sheep not only assisted to clean the land, but converted into profit

a certain amount of herbage that would otherwise go to waste. Altogether he considered that, apart from the returns from wheat and hay, the farmer with 700 to 800 acres in this district should be obtaining £80 to £100 per annum from other sources. To secure this would, of course, involve a good bit of labour, as they could not expect anything without work. In his opinion the cause of the want of success with many farmers lay in this question of labour. Very often too much is left to the hired man, and the result is not as it should be. To achieve success the farmer must not be afraid of work, and must see that everything is done properly.

HORSE-BREEDING.—Mr. Mitchell gave an address on "The Horse," dealing with the points of different classes of horses, and how to breed them. The necessity for at least one of the parents being of pure breed was strongly emphasised. In most cases both should be pure, but not necessarily of the same breed. For breeding roadsters he advocated mating a blood horse with a three-quarter-bred mare, while for a light draught the mare should be a pure draught. Mr. Jenkins referred to the value of mules in dry areas. They were much hardier than horses, and would subsist on very inferior food.

SEEDING.—Members generally preferred to sow wheat when the land was wet, but at the same time care must be taken not to sow when too wet to work properly.

Yorke town, July 9.

PRESENT.—Messrs. Correll (chair), Sabine, J., A. E., and C. Anderson, Vanstone, Jung, Koth, Domaschens, Davey, Bull, and Newbold (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed ten meetings held, with an average attendance of 8.5 members. Generally the work of the Branch had been satisfactory. The officers were thanked and re-elected.

DISC V. HOE DRILL.—Members were of opinion that the hoe drill, under most conditions, was a better machine than the disc drill.

CATTLE COMPLAINT.—Paper by Stock Inspector Needham on this subject was discussed. Members disagreed with the view that the disease was not a fever. They held that primarily it was fever, and that the paralysis of the digestive organs and impaction were the result of the fever.

Narridy, July 16.

PRESENT.—Messrs. Satchell (chair), Smart, Black, Hodge, Kelly, Flavel, Freebairn, and Dunstan (Hon. Sec.), and two visitors.

WIREWORM IN POTATOES.—Mr. Satchell stated that his potatoes were always attacked by wireworm, and he would be glad to know if anything could be done to prevent this. He had never known it in the cooler parts of the State. Various matters in connection with Congress were discussed.

Mallala, July 4.

PRESENT.—Messrs. W. Temby (chair), A. and H. Moody, Nairn, Loller, S. Temby, Worden, East, Jenkins, Marshman, Wilson, Churches, Nevin, and Stephenson (Hon. Sec.), and nine visitors.

CATTLE COMPLAINT.—Mr. H. Moody reported loss of cow. It appeared to suffer from paralysis of the jaw, and was unable to swallow her food or chew the cud. He found afterwards a large lump of hard, stone-like matter, similar to that described by Mr. Harris, of Kapunda Branch, in September, 1903. *Journal of Agriculture*. Owing to frequent summer rains she had had no well water for several months.

CANADIAN FARMING.—Mr. East gave an interesting account of his recent visit to Canada. In his opinion the Australian farmers were better situated as far as natural advantages were considered. The Canadian had many advantages, but he also had many disadvantages to contend with.

Naracoorte, July 9.

PRESENT—Messrs. Forster (chair), Coe, McLay, Williams, Cotton, Caldwell, Duffield, Attiwill, Malone, and Schinckel (Hon. Sec.).

MANGOLDS.—Mr. S. Schinckel read a paper on growing mangolds. The growing of mangolds in this district did not, in his opinion, receive the attention such a valuable fodder deserved. He was convinced they could grow mangolds on small areas on most of the farms in the district. A fairly deep loamy soil was best, and heavy manuring essential to success with mangolds. The preparation of the soil was a most important factor in the cultivation of this crop. He advised applying a heavy dressing of stable manure in April or May, and ploughing it under 6 in. to 8 in. deep. This will of course encourage a strong growth of weeds, which must be kept under by cultivation, taking care to avoid doing this work while the ground was wet. In August the soil should be again ploughed and worked to a fine tilth, and the seed sown in rows not less than two feet apart; 3 lb. of good seed will suffice for an acre of land. As soon as the young plants appear, a liberal top-dressing of salt will not only do the plants good, but destroy many grubs, etc. During growth the plants must be constantly hoed to keep the weeds down; he thought, in fact, that it was almost impossible to cultivate too often. A few years ago Mr. W. Pearson, of Meadows Branch, stated at Congress that he got from 40 to 60 tons per acre of mangolds. He gave the land 40 loads of stable manure per acre, and ploughed it in May. Later on he ploughed again, and applied 4 to 6 cwt. bonedust, and 4 to 5 cwt. salt. About the end of August seed was sown in drills 2 ft. to 2 ft. 6 in. apart. Mr. Pearson calculated that it cost for labour and manure £12 10s. per acre to grow a crop of 60 tons; he had grown as much as 80 tons per acre. In reply to questions, it was stated that mangolds had been purchased at Mount Gambier at 15s. per ton, and carted to Naracoorte. Mr. Coe advocated growing mangolds on some of the salty country in proximity to the swamps. Mr. Schinckel stated that he had harvested 40 tons per acre of the long red mangolds. The roots should not be dug too soon, and should be stored for some time before being used. Mr. Cotton thought they should exercise care in regard to stripping the leaves from the mangolds during growth, as if stripped too much the roots would be smaller and inferior. Mr. Attiwill spoke highly of the Golden Tancard mangold, which had done well with him; he agreed with Mr. Schinckel that the more manure applied the better for the crop.

Brinkworth, July 8.

PRESENT—Messrs. Cross (chair), Everett, McEwin, Ottens, Russell, and Stott (Hon. Sec.)

STANDARD BUSHEL.—Discussion on this subject took place, and it was resolved that the Chamber of Commerce be asked to fix the standard permanently at 62 lb. This Branch opposes the proposal to deal with this question by legislation.

TREE PLANTING.—Mr. A. L. McEwin read a paper on this subject. The present was a good time to get any tree planting done, and as he had noticed a good deal of wasted energy in this connection, especially in the planting of unsuitable trees, he wished to offer a little of his experience. The gum trees at Roseworthy College were an example, and he noticed that the Council of Agriculture had recommended their removal, and that pines be planted in place thereof. It had apparently taken 15 to 20 years or more to realise the first mistake, and in probably another 15 years the authorities would come to the conclusion that pines would not do. He was rather surprised to find certain gentlemen who had advocated the planting of belts of timber across the northern plains admitting a mistake had been made in this instance; but it gave hope that they were coming round to the right view of the case. He knew he would probably bring down on himself the wrath of these gentlemen, whom he greatly esteemed; but, at the same time, he thought the experience at Roseworthy was proof that their practical knowledge of the country had not been sufficient. [It is only fair to point out that Mr. McEwin appears to be under something of a misapprehension in respect to the sugar-gums at Roseworthy. Those it is proposed to remove are on either side of the main drive to the College; they were planted on a very stony limestone rise, and

while a number have made good growth, others have died out. As an avenue those remaining cannot be classed as a success. And while not advocating the planting of trees for commercial purposes in the dry areas, there can be no question that even Mr. McEwin would find a few acres covered with gums equal to the average of those at the College of some financial value. Then in respect to the pines, I have little fear that the Aleppo pine will thrive, as twenty years' experience at the College has already demonstrated that, although they do not make such rapid growth as the gums at first, they last much better, and make a shapely tree.—*En.*] While he gave place to no man in his appreciation of the beautiful, he thought it was time a little more common sense was exercised in respect to tree planting. He believed every farmer could, and should, grow a few trees around his homestead, as even if they were dwarfed and stunted, and were of no financial value, they would relieve the house from the gaol-like appearance which is given by the lack of trees and shrubs. Even a large, well-built farmhouse will present a bare, poverty-stricken appearance if there is nothing in the way of trees and shrubs to relieve it. In this district they could grow gums for appearance sake on any good, firm soil over clay; or, as one resident with considerable experience puts it, wherever stinkwort grows strongly in dry seasons gums should grow. In a loose, porous soil, especially where the clay is not close to the surface, gums will not grow for any length of time. For any practical purpose timber will not grow on these plains; beyond a few rails, and perhaps a beam or two for sheds, that a few pieces of native timber would be of far greater value, they will get nothing for their labour. For looks and shelter he found the pepper-tree did very well. They were hardy, quick growing, and make the best shelter and breakwind for this locality of any tree. He had tried both *Pinus insignis* and the Stone pine (*P. pinea*); but they made very poor growth for about ten years, and then succumbed. It was true that the dry years experienced prior to 1900 would severely try any trees; but they must not overlook the fact that they were certain to experience similar seasons again. He would advise those planting trees in these areas to plant on good, clay land, avoiding Bay of Biscay land, porous soil, and limestone. The land should be prepared the year beforehand; in fact, fallowed as for wheat, and the trees planted early in the season.

Port Elliot, July 16.

PRESENT—Messrs. McLeod (chair), Brown, Gosden, Pannell, Green, Basham, H. and H. B. Welch, W. E. and W. W. Hargreaves (Hon. Sec.).

CO-OPERATION.—Mr. Nosworthy forwarded a paper on "Should the Producers Co-operate?" He had been somewhat surprised that the Agricultural Bureau members had not done more to encourage the farmers and producers generally to co-operate. A branch of the Farmers' Union should be established in every farming district, as at present the middleman generally reaped more benefit from the farmer's labours than did the farmer himself. By co-operating the farmer could buy and sell better than he could individually. For instance, they all knew that a parcel of several hundred bags of wheat would realise more per bushel than say 50 or 60 bags. With a branch of a co-operative union with 20 to 30 members they could make a large parcel of wheat and sell it in one lot. Large quantities would be more eagerly sought for by the buyers, who would offer quite 2d. per bushel more than they would for small parcels. The same would apply to wool, sheep, fruit, and other produce. He held that the Branches of the Bureau should be the starting points for such useful institutions as a Producers' Co-operative Union. Members should form committees in every farming centre to see what help they could get in establishing branches of such a union. The union should not only act as an agency for the disposal of members' produce; but should also purchase supplies, and distribute the same at the lowest cost. To manage such a concern they would, of course, need directors and manager of the highest business capacity.

SELLING CATTLE BY WEIGHT.—Mr. W. E. Hargreaves read a paper on "Why Fat Cattle should be Sold by Live Weight." With cattle selling at high rates this question was frequently cropping up. It appeared to him to be strange that the practice of selling cattle by weight had not been generally adopted in South Australia; but he believed it would come in time, though.

possibly not until another generation of stockmen had taken the place of the present generation. In some of the States stock of all kinds were sold by live weight, and he thought it should be compulsory for every public market to have a weighing machine. He knew the butchers, who preferred the present system, would strongly oppose such a system; but it would not be difficult to divine the reason. Their experience in slaughtering and handling cattle enabled them to judge pretty close the dead weight of fat cattle; but the scales would enable the farmer to gauge the cash value of each beast. The weight-guessing competitions at their agricultural shows always caused a deal of interest, and at the same time often illustrated how far out the practical butchers sometimes are in their estimates of the weight of stock. The competitions also showed how far astray farmers and graziers get when they attempt to estimate the weight and value of cattle: whereas under the weighbridge system they would know the exact weight. He could see no difficulty in carrying out the system, as their cattle were not usually very wild, and they could be weighed without much difficulty. The system only needed a proper trial to prove its fairness to both buyer and seller. Members generally agreed with the writer of the paper.

PIG COMPLAINT.—Mr. H. Welch stated that he had a sow which farrowed about four weeks previously which was very weak in the back and hind-quarters. The young were in good condition, as was the sow otherwise. She was in a warm, comfortable yard, and received grain, green feed, and milk. Mr. Green stated he had a young sow similarly affected. He had treated it with mustard and linseed meal in milk, and it appeared to be improving. Members thought the pigs had caught a severe cold in the back, but would like to know if any other members have experienced similar trouble.

Johnsburg, June 25.

PRESENT.—Messrs. Chalmers (chair), Masters, Dunn, McRitchie, Sparks, Hombsch, Luckraft, Caughlan, Potter, and Johnson (Hon. Sec.).

SALT PATCHES.—Mr. Hombsch called attention to fact that salt patches were spreading on many farms in the district; the only plant that would grow on these patches was a green trailing plant like the "squash weed." Members had also noticed the spread of these salt patches on high land as well as on low land. Growing salt-loving plants was suggested by one member; and spreading a good dressing of stable manure was stated to do good.

ANNUAL REPORT.—The Hon. Secretary's report showed that six meetings had been held during the year, with an average attendance of eight members. Three papers had been read, and, considering the absence of a number of members from the district at various times, the work on the whole had been fairly satisfactory. Messrs. J. R. Masters and J. Johnson were elected Chairman and Hon. Secretary respectively for the ensuing year.

Balaklava, July 9.

PRESENT.—Messrs. Robinson (chair), Anderson, Baker, Black, Hains, Manley, Neville, Reid, Smith, Spillane, Tiller, Tuck, Thompson, and Burden (Hon. Sec.), and eight visitors.

STANDARD BUSHEL.—Petition for a fixed standard of 60 lb. per bushel, initiated by Kapunda Branch, was again discussed, and Mr. W. T. S. Harris, the local miller, attended, and spoke at the invitation of the Branch. He thought no question connected with the wheat trade was more misunderstood than this matter of the standard bushel. The suggested petition contained statements that were not correct. Their wheat was not bought on the standard fixed by the Chamber of Commerce, and sold on a 60-lb. standard, as stated: it was both bought and sold on the standard adopted for the season. English grown wheat was sold on a 60-lb. standard; but it did not realise so much as South Australian, a recent quotation being 26s. 9d. per quarter, as against 29s. 7d. for South Australian. If they made the standard 60 lb., as suggested, it would unquestionably result in lowering the price of their wheat. There were several important questions bound up in this matter:—1. Was a standard necessary? They must answer yes, as buying in large

quantities, and over a large area of country, it was impossible for the wheat merchant to deal with each sample individually. 2. Should the standard be a fixed one? He thought that from a buyer's point of view a fixed standard would be better than the present system of fixing the standard for each season. 3. How should the standard be fixed, and at what weight? He held that the system of fixing it by the weight of a measured bushel was the correct one. The average weight of the standard samples for 10 years was 62½ lb.; but he believed it would pay the farmer to have it fixed at 64 lb., as it advertised the fact that the wheat was first quality. 4. In whose interest should the standard be fixed? He said in the farmers. Instead of lowering the standard to 60 lb., which would reduce the price by 2s. per quarter, he would raise it to 63 lb., and dock for what was under that weight. In this case the man with wheat going 62 lb. would still get as much for it as if the standard was 62 lb., while the heavier wheat would benefit by the higher standard. Farmers who sold before the standard was fixed did not lose what they were docked, as when the standard was lowered the price dropped proportionately. In reply to questions, Mr. Harris said one standard was quite sufficient, as to have two grades would cause a lot of difficulty. It was true a buyer might ship 60 lb. wheat and 64 lb. wheat in one vessel: but as he had to sell on the f.a.q. sample sent to London, he would probably have to put up with claims which would be settled by arbitrators. After further discussion it was resolved that the previous decision in favour of Kapunda petition be rescinded. It was also resolved by a large majority that, in the opinion of the Branch, it was desirable that there should be a fixed standard of 63½ lb. A vote of thanks was accorded to Mr. Harris for his attendance and remarks.

Kingscote, July 11.

PRESENT—Messrs. Furner (chair), Olds, Wright, Bates, Ayliffe, Nash, Melville, and Cook (Hon. Sec.), and two visitors.

STANDARD FOR BARLEY.—Considerable discussion took place on the question of the adoption of a standard weight for the bushel of malting barley. The Chamber of Commerce had been communicated with, but had replied that they could not see their way clear to accede to the wishes of the growers in this respect. It was decided to communicate with other Branches with a view to bringing pressure to bear on the Chamber. The question of docking for wheat under standard was also discussed, and the present system of refusing to pay extra for over-standard wheat, while docking under-standard samples, was strongly condemned.

Petina, July 25.

PRESENT—Messrs. W. Penna (chair), R. and H. Penna, Lutze, Starkey, and Kiddaman (Hon. Sec.), and three visitors.

HORSE-BREEDING.—Mr. W. J. Johnstone read a short paper on this subject. He would not advise farmers in this locality to breed heavy draught horses, as the medium draught was more generally useful. Such an animal they would get by mating a draught mare to a blood horse. Every farmer, however, requires two or three fairly heavy horses for shafters for dray or wagon. He would advise every farmer to breed his own horses, as he can breed good animals cheaper than he can buy, and with less risk of loss from inferior animals. One visitor held that four medium draught horses, well fed, would do more work than six light horses. Members generally thought horses by a blood stallion from draught mares would be too light for farm work.

CONCRETE TANKS.—Mr. Lutze initiated a discussion on this subject. He instanced a tank to hold 17,000 gallons being built in the neighbourhood at a cost of £9 12s. 6d. For stopping leaks in underground tanks, Mr. W. Penna advised working cement wash into the cracks. Other members thought a good coating of tar would be more effective.

RABBIT DESTRUCTION.—In reply to a question, a member stated that poisoned baits distributed along a newly turned furrow in March and April was the most effective way of poisoning rabbits.

Gawler River, June 24.

PRESENT—Messrs. Dawkins (chair), Leak, Hillier, Kreig, Spencer, F. and H. Roediger, and Bray (Hon. Sec.), and one visitor.

DAIRYING.—Mr. J. Spencer read a paper on this subject. In starting dairying the selection of a good herd of cows takes time and money, as good cows are not readily parted with by their owners. Then the dairyman must look to the means of replacing the cows as they get old. This is best done by keeping a good bull and rearing a few heifers each year from the best cows. Not sufficient attention was given by many dairymen to the selection of a good bull. He preferred the Shorthorn strains of cows, as they were quiet, good milkers, not so timid as some breeds, quite hardy, and good foragers. He thought the heifers should come in at two and a half to three years old. The calf should be tied up for a time when young, as they never afterwards forget the experience. Then, if turned loose in a yard made of good wires, so that they cannot get through, they will recognise that a fence is something that is to keep them within bounds. Rugging of cows is much recommended now, but he preferred to provide shelter by means of clumps of trees and straw stacks, and to feed them well. In this district, from January to April, some green feed should be provided where water is available. Lucerne was the best of all fodders. Sorghum was hardier than maize, and more suited to this district. Barley and rye, sown after the first rains, and fed off, pays well, besides which it allows the dairyman to let the natural grass get a good start. The private separator had proved a great boon to local dairymen, but he thought there was room for a butter factory in this district, as large quantities of cream were sent to Adelaide to be made into butter and brought back to Gawler for sale. A discussion ensued. Members considered that breed and condition of cows affected the age at which it was advisable for them to come into milk. Large-framed breeds and well-grown heifers were fitted to come into milk earlier than stunted and small ones. The feasibility of a butter factory being worked in Gawler was discussed. Members considered there was an opening for a local factory, provided there was an honest man at the head of affairs. It was thought it might be worked on the co-operative principle. Mr. H. Roediger stated that his short experience with rugging had proved that in cold, frosty, and bleak, stormy weather the cows did not decrease in milk as they did when un-rugged in similar weather. Shelter such as straw stacks and clumps of trees was advisable, but would not serve as a substitute for rugging. Mr. A. M. Dawkins quoted Inspector Williams in that impaction was often due to impure water, being all that was available, of which the cattle would not drink sufficiently. In summer time plenty of pure water, together with the feeding of molasses and salt, would go far to prevent impaction. Salt and lime in water were considered to be beneficial where water is fresh and soil deficient in lime. Heifers should be kept in milk as long as possible, as if allowed to dry off early they will have a tendency to become short milkers. In feeding sorghum young and second growth should be fed with care, as they are likely to prove injurious if fed largely. To chain a bull, it was recommended to place a short piece of chain around the horns; attached to this is a sliding ring, to which the main chain is fastened. This effectually prevents galling.

Stockport, July 25.

PRESENT—Messrs. Branson (chair), Stribling, Smith, Perry, Godfree, Megaw, Watts, and Murray (Hon. Sec.), and six visitors.

STANDARD BUSHEL.—Mr. Wunnenberg read a paper on this subject. Dealing with the question: "When should the standard be fixed?" he pointed out that parts of the Upper North were two months earlier in harvesting than in the South, and about six weeks ahead of this district. Then, the wheat from the North might be prime or shrivelled, and just the reverse in this and other districts. It seemed to him that it was impossible to fix a standard that would be fair to all parts; but, at the same time, it was out of the question to make separate standards for each division of the State. To those in the Middle North who advocated fixing the standard early he would point out that the

early reaped wheat usually weighs 1 lb. to 1½ lb. per bushel more than the wheat reaped when quite ripe and dry; therefore by fixing the standard early there was considerable risk of much of the later wheat failing to reach it. His remedy would be to have a permanent standard of 62 lb. per bushel. While this was quite high enough for all practical purposes it would also suit all districts. He strongly condemned the practice of judging the weight of wheat on the small sample. There was no difficulty whatever with the small measures used in making the supposed weight vary to the extent of 2 lb. to 3 lb. per bushel. Uniformity in the matter of filling the measure, whether it be the Imperial bushel or the small cup now used, was essential to uniformity in results. In regard to payment for over-standard wheat, he contended that the farmer received extra payment, inasmuch as all the wheat was bought on a weight of 60 lb. per bushel. He thought, however, that in docking for wheat under standard, instead of reducing the price by 1d. per bushel for each pound under standard, the weight paid for should be reduced 1 lb. for every pound under standard. Under the present system the lower the price of wheat the greater was the proportionate reduction in price. In his opinion, bleached wheat was not injured for flour-making, but in grinding it does not cut so clean as unbleached wheat. With present appliances, however, the bran gets rolled a second time, and the miller gets out all the flour contained in the wheat. The apparent loss in weight of bleached wheat was due to the fact that when wetted the grain swells, but on drying again it does not shrink to its former size, consequently the same weight of grain occupies a larger space, or weighs less per measured bushel than originally. Where, however, wheat has been wetted several times it may be seriously injured from a commercial aspect.

ANNUAL REPORT.—The Hon. Secretary's report showed that the average attendance last year was only six, and strongly urged members to make an effort to attend regularly and also take their share in the work of the Branch. Messrs. C. Perry, C. Branson, and J. Murray were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Clarendon, July 13.

PRESENT—Messrs. Payne (chair), Morphett, Juers, Phelps, Reece, Dunmill, and Wright (Hon. Sec.), and two visitors.

REGISTRATION OF COWS.—Some discussion took place in reference to the registration of cowkeepers under the Health Act. Members considered this unnecessary, and it was decided to ask the Local Board of Health to oppose the proposal. Other matters of local interest were discussed.

Forster, July 16.

PRESENT—Messrs. Bolt (chair), W., J., and F. Johns, Retallack, A. and E. Schenscher, Pain, Hayden, and G. Johns, jun. (Hon. Sec.)

SIZE OF WHEAT SACKS.—Discussion on this subject took place. Members were strongly opposed to the proposed alteration in the size of the wheat sack.

Hartley, July 22.

PRESENT—Messrs. Wundersitz (chair), W. and C. Brook, J. and T. Jaensch, Hassam, Reimers, Stein, and Fry (Hon. Sec.), and three visitors.

SIZE OF WHEAT SACK.—Members do not approve of any alteration in the size of the wheat sack.

FOXES.—Members reported that foxes were increasing in this district, and becoming a serious nuisance to owners of sheep and poultry. Some members doubted whether the foxes would trouble sheep very much so long as rabbits were plentiful, but the others held that active steps should be taken to cope with the foxes before they became too numerous.

Bowhill, July 22.

PRESENT—Messrs. Dohnt (chair), Waters, Whitfield, Drogenmuller, Johnston, Norman, Tyler, Weyland, and Kildea (Hon. Sec.), and two visitors.

STANDARD BUSHEL.—Resolution from Crystal Brook Branch asking that the members support proposal for a permanent legal standard of 62 lb. per bushel was discussed, and generally approved. Members also thought that action should also be taken in reference to the manner in which the weight of the sample was determined.

POULTRY.—Mr. Norman initiated a discussion on Mr. Rathbone's article on the commercial aspects of poultry farming. He was convinced that farmers, as a rule, did not realise the extent to which poultry might be made a source of income. With the natural advantages in their favour, they should make the poultry a very profitable investment. Members considered Mr. Rathbone's estimates too irregular, the scale of his poultry houses needlessly extravagant, and the scheme generally too expensive.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from June 28 to July 28, 1904.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	34	75	179
Carpenters	2	—	—
Masons and bricklayers	—	—	1
Boilermakers and assistants	1	—	—
Blacksmiths and strikers	6	1	—
Fitters and turners	1	—	—
Enginedrivers and firemen	—	1	—
Moulders	—	—	1
Brassfinishers	1	—	3
Plumber and ironworkers	3	—	1
Painter	1	—	1
Compositor	1	—	—
Cook and sculleryman	—	—	1
Camel driver	—	—	1
Shepherd	—	—	1
Sailmaker	—	1	—
Apprentices	17	1	2
Cleaners	7	4	—
Porters and junior porters	8	2	—
Rivet boys	3	—	—
Totals	85	85	191

July 29, 1904.

A. RICHARDSON, Bureau Clerk.



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AND

Industry.

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SEPTEMBER 1, 1904.

VOL. VIII.

FURTHER NOTES ON FRUITGROWING IN TASMANIA.

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

TYPES OF APPLE AND PEAR TREES.

In 1896, when the codlin moth trouble was causing much acrimonious discussion among our apple-growers, many of whom did not hesitate to declare that no means of effectively coping with the insect were likely to be found, quite a new interest was introduced into the matter by an illustrated article which Mr. W. C. Grasby published in *The Garden and Field*, on his return from a visit to Tasmania. In that article the writer showed what an important factor the training of the trees had proved in facilitating the control of this pest in the island colony. Since that time Mr. Grasby has, with commendable persistency, urged our growers to adopt something on the lines of those methods followed by the Tasmanian apple growers in the training of their trees.

Although the methods so generally followed in Tasmania for dealing with the codlin moth are probably never likely to be reverted to here, the importance of a system of training trees which will make possible the most economical application of the more modern means of combatting this pest cannot lose any of its value so long as we have this trouble to contend with. To my mind, in the training of his apple trees chiefly lies the secret of the successful results obtained by the Tasmanian grower. Questioned as to whether South Australian growers may learn anything from their contemporaries across the straits, I would most certainly reply: "One thing, and that is to train up trees which are capable of carrying much more regular crops of fruits of even quality during a succession of years." Whether the necessities of the codlin moth scourge alone caused the adoption of the type to be outlined herein, I cannot say; but if no other advantages were foreseen, they certainly have been realised by its adoption. Probably it is only a natural sequence to this and other practices to find that many of the Tasmanian fruitgrowers have most certainly arrived at that stage of intense culture which clearly proves that a large amount of energy, skill, and judicious monetary expenditure devoted to a small area yields a comparatively higher profit than slipshod, cheap, and unscientific methods applied to a large expanse of land. As pointed out in a preceding article, I am of the opinion we have large areas of soils in most of our apple-growing districts which are capable of sustaining trees in full bearing for a much longer period of time without a large expenditure on manures than most of the land which I saw devoted to fruit culture in the island State. In such places there is, with the assistance of scientific cultivation, sufficient moisture received by the soil to sustain the greatest drain which evaporation and leaf transpiration are likely to impose upon it. Owing to these considerations, and in presence of the fact that better prices have been realised in England for our fruits than for those from the island State, one may pertinently ask: "Why should our growers not set themselves out in earnest to capture a large share of what

promises to be an extensive and ordinarily profitable business?" To do this the first item is the production of the tree. This tree must be capable of maintaining, with as little fluctuation as possible, a high average yield of fruit of prime quality. Being in a position to maintain a regular supply is probably the first factor which can enable a beginner to gain a footing in any trade, and certainly without it no status can be upheld in an open market. I believe it will be freely admitted that the writer has had exceptional opportunities of observing the natural conditions which prevail in the fruit-producing areas of this State and of the produce raised thereon. With the exceptions provided by some peculiarly sun-searched positions I have no hesitation in recommending the owners or prospective planters of apple orchards in South Australia to follow the lines which in the training of apple trees have proved so eminently satisfactory in Tasmania. The type of tree alluded to calls for little skill in manipulation after the foundation has been laid. Its structure may be likened to an inverted hollow cone which rests upon its apex—the trunk. This figure implies the possession of no trunk, and, though actually this is incorrect, it is nominally so, for the stem is only sufficiently long to prevent the base of the main arms arising from the ground level. These arms are subdivided, and even re-subdivided when necessary, as low as practicable, until from eight to fifteen leaders are secured. These leaders are not again bifurcated, but at each winter's pruning the growth from one bud only is permitted to ascend to continue the extension and leading direction of the branch. All others on the more vigorous trees are summer pruned, and thus subdivided into laterals of a fruit-bearing character. This tree possesses many excellent economic advantages, which evidently have been evolved out of the necessities of conditions through which the industry of fruitgrowing has passed in the island State. In the Huon Valley, acres of giant trees of the French crab apple may be seen, beneath the wide-spreading branches of which herds might graze and flocks rest during the noonday heat. Enquiries and observations showed that diseases and pests—levellers always, whether it be plant or beast or mankind that is concerned—had not yet begun that inevitable process. In somewhat later established orchards the lengthy stem has been eliminated, but the willowy arms are still found prone to the ground with their burdens of ruddy fruits. (This may be dimly seen in Plates I and II. in my notes in last month's issue.) In some of the newer districts, as shown in Plates IV., V., VI., and VII. of this number, their weakness is being corrected, and the more rigid trees stand erect, holding their heavily laden branches out of the way of the cultivating implements. It must not be inferred that all of the trees in the orchards of Tasmania possess these ideal characteristics: for it seemed to me that many growers there possessed but a hazy grasp of the general principles involved in the training of a tree after the stage of setting a short stem had been passed. The common mistakes of permitting the leading branches to ascend in height out of proportion to their rigidity, and the too early formation of fruits upon the extremities of such limbs must militate strongly against the prolonged profitableness of such branches, not to mention the injury wrought upon the tree as a whole. In adopting this system of training here, where the importance of conserving the soil moisture by means of cultural operations sustained throughout the summer is imperative, it is of the utmost moment that greater stability be secured. The advantages claimed for this type of tree are manifold. To my mind it represents the highest point yet reached in the economic production of first-class fruit. It has been argued that in our climate the bark and fruits would be sun scalded, but a glance at the accompanying illustrations will turn this objection to nought and clearly indicate that as a means of protecting these parts it has decided advantages over the type of trees seen in the average orchard upon the mainland of Australia. Properly manipulated, the spur growths encircle the cordon branches with wreaths of foliage, which, while admitting enough sunlight to ripen the buds and colour the fruits, do not favour injurious sun effects upon the bark. These spurs extend along the main arms and leaders from the junction with the trunk to the extremities of the stiffened points, and the bulk of the crop is carried upon the parts before the elevation is reached where most of our apple trees begin to form fruit spurs. In a country peculiarly subject to wind storms and great evaporation, what can appeal to the reason more than these points? The cheapness of fruit production must be studied in every detail, and circumstances which permit of dispensing with the step ladder in pruning, harvesting, and treating for diseases will most certainly help our growers in the primary acts of placing their productions on the world's markets at the lowest cost. The treatment of pests

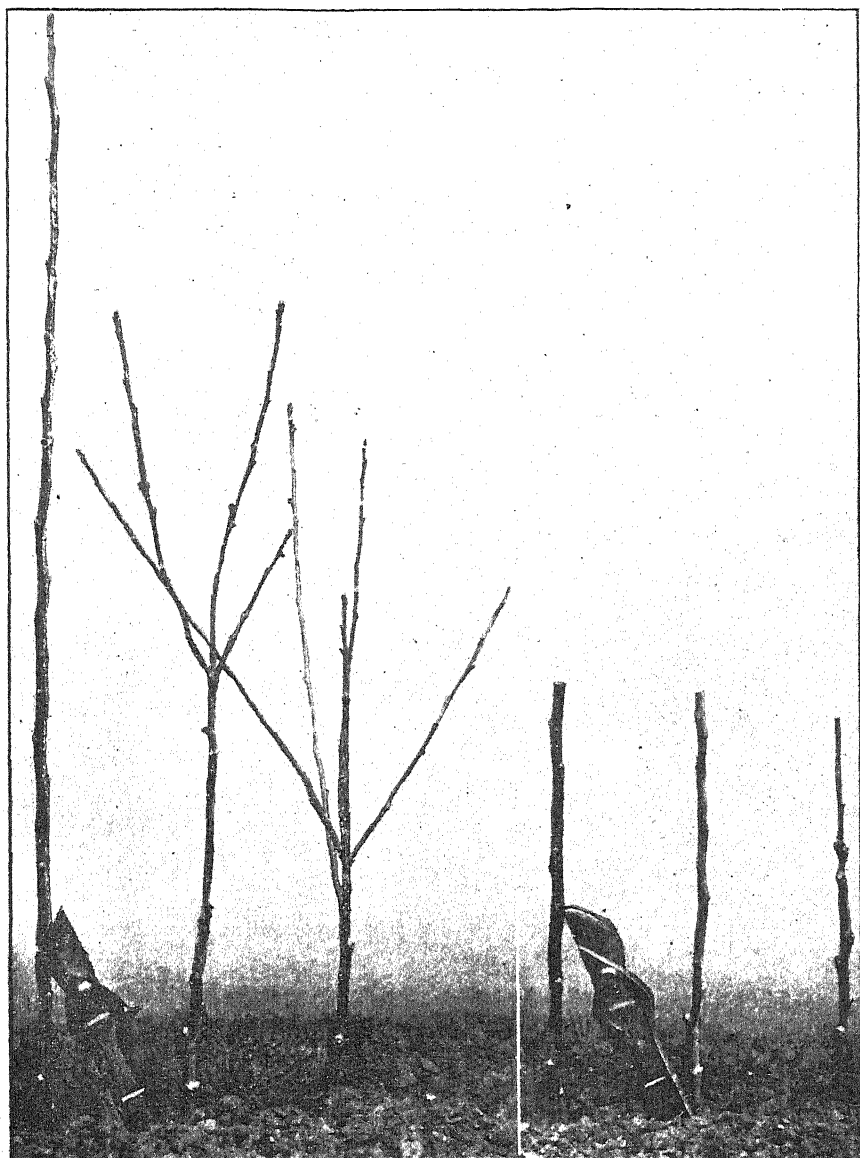


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Plate I.—Types of Apple Trees as received from nursery, and the pruning suggested at planting.

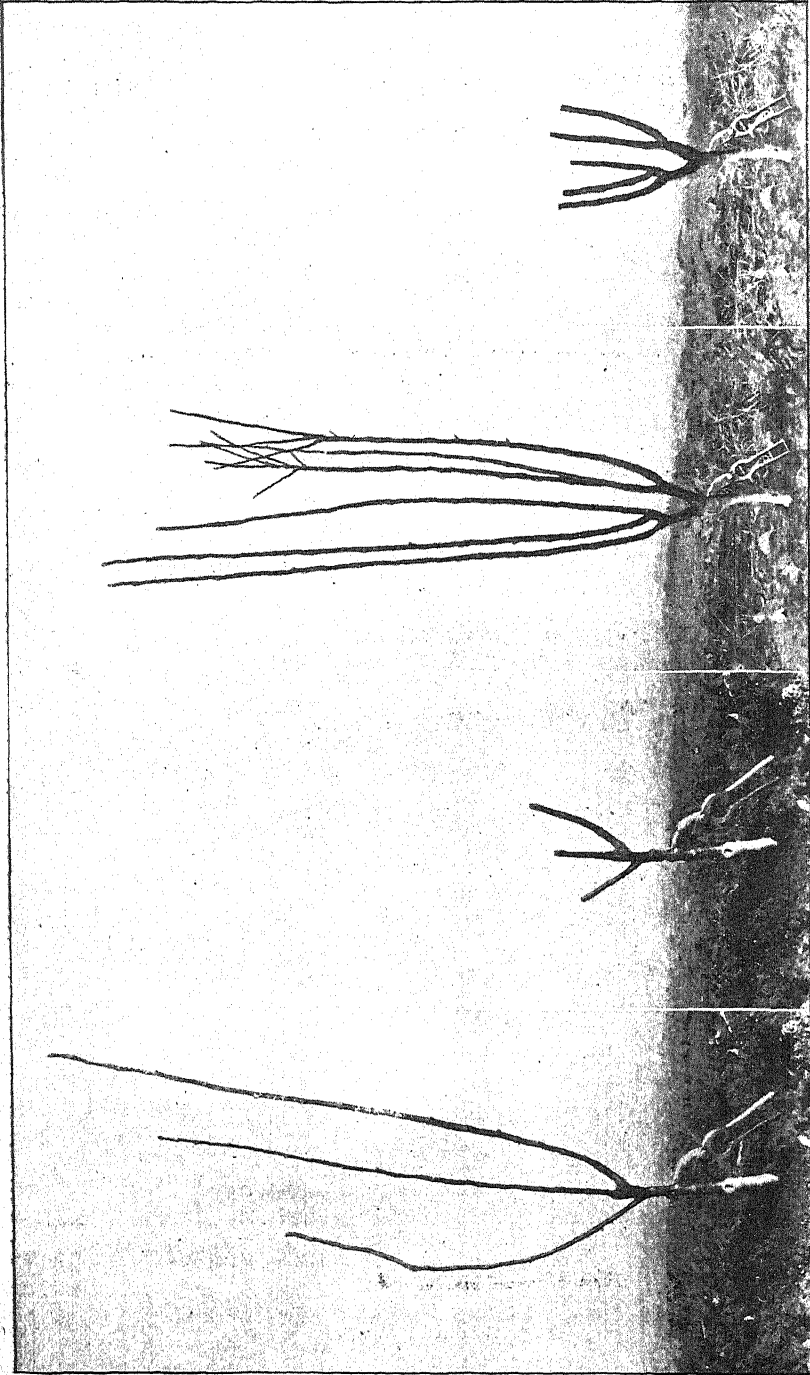


Fig. 1. Fig. 2. Fig. 3. Fig. 4.
Plate II.—Types of Apple Trees, before second and third winters' pruning, and treatment suggested.

and diseases, such as the fusicladium fungus and codlin moth, are brought within the bounds of an effectiveness which is also inexpensive by having the parts attacked in a position readily accessible to the operations of the remedy.

Although, with the exception of the shorter stem, there is practically nothing in the principle of framing these trees which has not already been repeatedly described and illustrated in these columns, I trust the importance of the matter will be an adequate excuse for again reverting to the subject. The best form of young tree upon which to begin is one possessed of a single clean shoot which during the previous summer grew unbranched from the bud or graft. This will be furnished with buds capable of starting into growth with great activity in the coming summer. This shoot must be cut off when planted at a height of from 9 to 15 in. above the ground level. (See Figs. 1 and 4 of Plate I.). If a number of side shoots have emerged from the stem in the nursery, as shown in the specimens 2 and 3, figured in Plate I., these

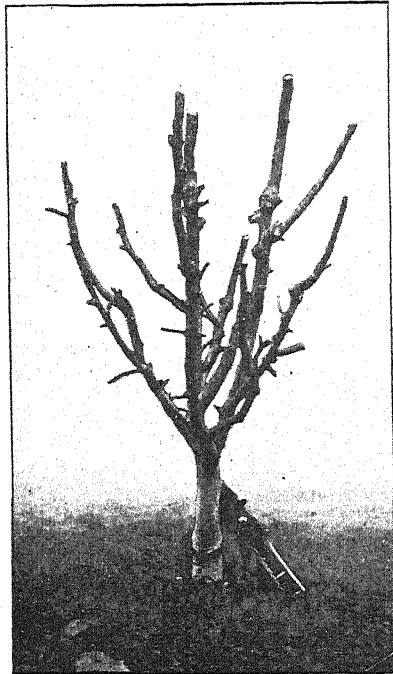


Plate III.—Fourth winter's pruning.

will, if the other buds are intact and healthy, be best cut away, as shown in Figs. 5 and 6 on the same plate. This will give a stronger and usually a more even start to the branches sent out from such buds. With a view to widening the centre of the tree it is a good plan to leave a long piece of the internode projecting above the topmost bud. This acts as a temporary protection to this bud against accidents, and turns its line of growth away at a broad angle from the central axis or stem. At the next winter's pruning this stub, which will have dried, must be cut away, and the wound encouraged to heal over rapidly. In the case of older nursery trees which have branched, and from the stems of which the primary or original buds have fallen, or been removed, the injury to the roots must usually be counterbalanced by reducing these side shoots back to within one or two buds of their junction with the main stem. The number of branches which are permitted to rise from the stem cannot be arbitrarily fixed, and whether 2, 3, 4, 5, or 6 arise, providing they



Plate IV.—Sturmer Pippin Apple Tree, in Bagdad Valley, Tasmania, carrying a good crop of fruit.

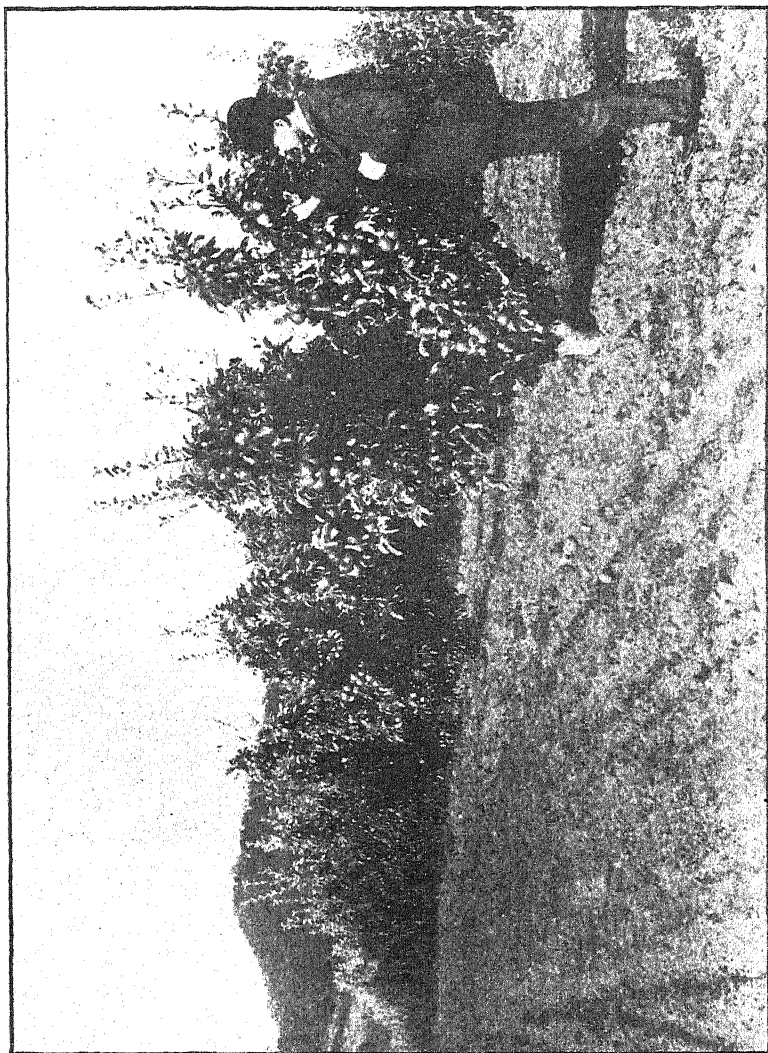


Plate V.—Sturmer Apple Orchard, in Bagdad Valley, Tasmania.



Plate VI.—Scarlet Nonpareil Apple Tree, in Bagdad Valley, Tasmania.
A profitable type of tree.

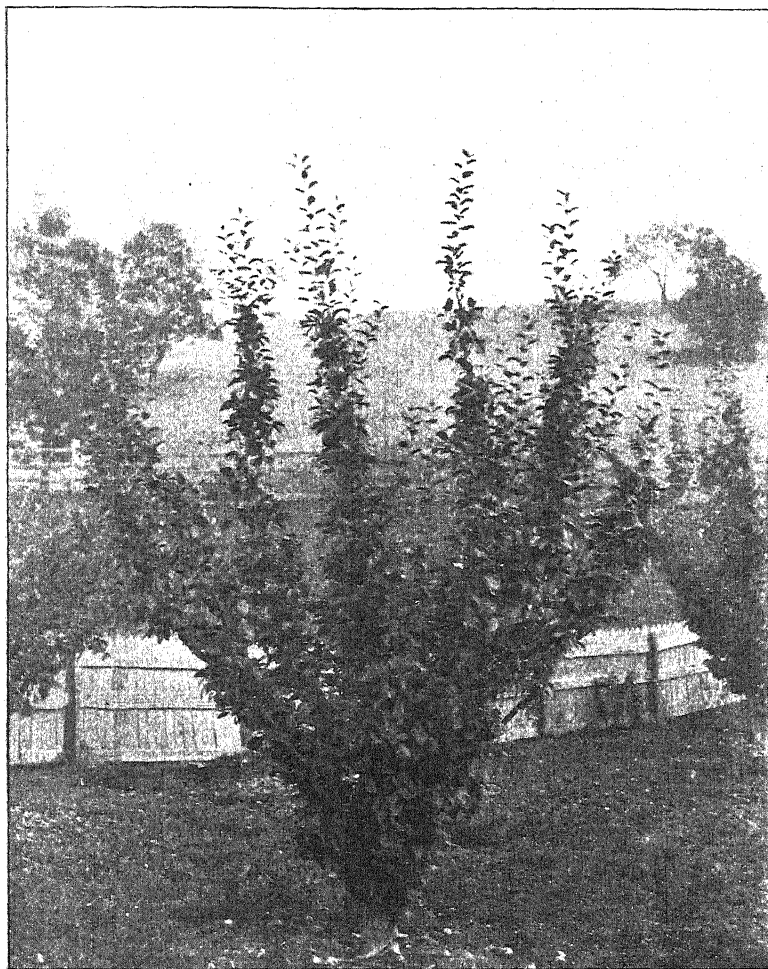


Plate VII.—Adams Pearmain Apple Trees, thirteen years old, at Bushy Park, Tasmania. Showing tree when relieved of its fruit.

are not crowded, and each possesses a good grip on the main stem, is of little importance. During the first spring and summer the sappy growing points of the stronger ones are pinched out once or twice to temporarily check them, to the gain of the weaker and shorter, which are usually the lower ones. Should there be a greater number than four, a sufficiency of leading branches will be obtained if each be subdivided once. In the case of those possessing three or four limbs, a second subdivision will be desirable. In order to secure the whole of the cordon branches at an early stage in the formation of the tree, it is necessary to prune the branches back, leaving a few buds only on each. This will tend, under ordinary conditions, to induce the tree to send up a few very strong branches.

In Figs. 2 and 4 of Plate II. the second and third winter prunings are shown as applied to a tree with three main arms. The secateurs shown in these plates are 9 inches long, so it will be seen in Plate II. that the main arms start at about 9 inches, and the secondaries at about 13 or 14 inches, while the whole of the cordon branches (which are the final subdivisions) will be started at a height of from 18 to 20 inches above the soil. It will be seen in these plates that weak branches are always cut shorter in winter than long ones; but, of course, as indicated above, only the strong shoots are checked during the growing season.

In Plate III. the fourth winter pruning of a slightly irregularly formed tree is shown, and none of these top branches will be allowed to subdivide again. In a general way it may be taken for granted that all strong-growing trees will demand attention to their lateral growths after the third winter pruning. As foreshadowed above, the hard pruning necessary to secure the formation of stout, foundation branches will result in starting a greater number of buds into growth than shoots are required for leaders. These, with the exception of one—or, at the most, two—of the topmost must be cut back in summer, if the proper type is to be secured. Without this manipulation of the laterals in summer it is quite impossible to secure the best results, and the neglect of this practice in the past has turned our orchard trees into dense, isolated thickets, until the weight of fruit opened them out in an irregular and oft-times ruinous fashion. The summer manipulation may consist of (1) an early summer cutting, which usually results in a second cutting away of the renewed growth being necessary later on; (2) a late partial fracturing of the laterals when the sap is falling in late summer; or (3) a complete removal by means of a fracture or rough cut section through the lateral. In each case the section is made above the third to sixth bud from the base of the lateral. Some sorts, such as the well-known Jonathan variety, do not respond from the lower buds upon the laterals; but most of our popular sorts send out short wood spurs from the buds on the stub as a result of this complete severance, if it is not done too late in autumn. After trying all of these methods, I am of the opinion that the late complete fracture, applied just after midsummer, gives the best results and is of the least trouble. Should the laterals be severed too early, the top bud upon the stub will often grow out into a secondary lateral during the same summer. When these second growths exceed 3 or 4 inches in length they are usually cut back to their bases at the next winter pruning. The winter pruning, therefore, is simplified into pruning back the single leader to a length commensurate with its stoutness, and reducing any of these secondary laterals back to their bases, or to spurs already formed. As the trees grow older, and the fruit production begins to exceed the wood growth, it will be necessary to thin out the much subdivided spur growths whenever they show signs of weakening. The terminal portion of the leaders should always be kept fairly free of fruit-bearing wood, as this will keep up a certain amount of top growth, which is conducive to a proportionate degree of root activity, which is desirable in every fruit tree if its profitable character is to be maintained. The erect position of the leaders is likewise less endangered by this practice.

EXPORT OF APPLES.

The following report by Mr. E. Burney Young, formerly Manager of the London Wine and Produce Dépôt, has been received by the Hon. Minister of Agriculture:—

"The net result of the season's operations I fear will cause no little disappointment, which is attributable:—1. To the large quantity of American apples kept back in cold store and thrown on the market at the same time as ours, some of which are still to be seen in the shops. These apples, though distinctly inferior to the Australian in quality, helped to depress an already well stocked market. 2. The bad condition in which some of the cargoes arrived. 3. The very large extra quantity of fruit shipped from Australia and Tasmania, as compared with any previous year, being more than double last year's shipments.

"The question of the carriage of fruit by the steamers is a very serious one. Some cargoes arrived in extremely bad condition, owing to the defective working of the refrigerators. Unless more certainty can be introduced into the carrying of the fruit it will very seriously injure the fruitgrowers' interests. The time has arrived, now that the fruit trade has assumed so large dimensions, that efforts should be made to fix some responsibility on the shipowners for the carriage of fruit. The first condition might reasonably be that the fruit is cooled to a temperature of, say, 45 to 50 degrees before shipment. If apples were delivered to the ships at that temperature, and in good condition, there is practically no risk whatever in carrying them to London, provided ordinary care is exercised by the ship's engineers, and the refrigerators are properly constructed. The shipowners charge a heavy freight for this cargo, and it is nothing less than absurd that they should be exempt from all responsibility. In speaking of the temperature at which it is suggested the fruit should be delivered to the ship, it should be clearly understood that I do not mean that it is to be carried at that temperature. But it is easily to be understood that if the fruit is delivered on board at a very high temperature it may be difficult to reduce it quickly in the ship's hold to the required temperature; and in order to remove every obstacle, and to be able to approach the shipowners with a good case, I suggest the reduction above mentioned, which should amply meet the case, and the extra cost would be compensated for in the better security given for the carriage of the fruit, assuming, of course, an equitable agreement is made with the shipowners. In alluding above to properly constructed refrigerators, I do so advisedly, because I have it on very good authority that some of the ships which undertake the carriage of fruit are defective in this respect. There is therefore an additional reason for some responsibility resting on their shoulders, as they would take care to remedy any shortcomings. The trade has now become too important to palter with, and the matter should be taken up with determination.

"In regard to the marketing of the fruit in London, one of the faults noticeable with South Australian shipments is slack packing. Boxes which should contain at least 40 lb. of fruit net very often contain no more than about 30 lb. This is a very great discrepancy. I have noticed these short weights in cases otherwise carefully packed. Quantities of unnecessary packing are placed on the top and bottom of the cases. If the apples are carefully wrapped and tightly packed, and the crevices filled with a little wood wool, nothing more is required. One sometimes sees nearly a quarter of the case filled up with paper shavings, which are useless and unsightly. Complaints on this score have been very frequent this year. Some investigation should be made in regard to cause of 'spotty' apples. Many of the apples are covered with small brown spots, which eat into the apple a considerable distance, and they spoil its sale.

"I shall probably not be blessed if I reopen the question of the codlin moth, but as I have personally come across the grub in consignments we have had to deal with, and have seen the traces of a great many more, one cannot but record one's experience. I cannot say that it has proved to be very prevalent, but unless it is kept in check it will prove the worst enemy that the trade has to contend with. While some of the marks shipped have been consistently well packed and graded, and the quality of the fruit very good, others, on the other hand, show the old faults of not grading. Frequent attention has been drawn to this defect in my reports of former years, and growers cannot be too strongly impressed with the necessity of grading. A buyer who requires a case of large apples does not want small ones, and, *vice versa*,

the man who has a trade in medium and small fruit, which he sells to the customer who can afford to pay only, say, a penny for an apple, or expects to get half a dozen for 5d., looks upon the large apples in a case as so much waste, and consequently the sale price is spoilt for either class of buyer.

"Any attempt to give average prices would be utterly misleading, owing to the bad condition in which some cargoes were delivered, and the unevenness of others, but from a careful comparison of the prices of a number of marks which arrived in good condition with the same marks which arrived in good condition last season there appears to be an all-round reduction in price as compared with last year of 20 per cent. to 25 per cent. for sound fruit; but there is a greater reduction in the average if the unsound fruit is reckoned, as there was a much larger percentage of unsound fruit this season than in 1903. The very latest arrivals, which have had to compete with English soft fruit, have fared badly. The prices obtained for the Dorset shipment, the last arrival, which comprised 40,000 cases of Tasmanian apples, would not average 5s. a case. The above remarks are applicable entirely to apples. Three hundred and ninety cases of pears were shipped to the care of my Company, very few of which turned out sound, which averaged 9s. 6d. per case. The prices ranged up to 20s. for good sound fruit. Two hundred cases shipped per the Orestes averaged 12s. per case. Pears, in my opinion, should be carried separate from and at a lower temperature than apples if they are to be given a chance. If they arrive in good condition they invariably bring good prices, 20s. a case being not uncommon, but, unhappily, there are so few of them."

It will be noted that Mr. Young refers to the depressing effect of the large quantities of American apples kept in cold stores and placed on the market at the time our fruit arrived. It is somewhat consoling to Australian growers to learn from a good authority that the storing of these apples resulted unfavourably to those interested, and that it is questionable whether the practice will be repeated to anything like the same extent in future years. The conditions under which we ship our fruit are referred to by Mr. Young, and all interested in the fruit trade should assist the local Fruitgrowers' Association in its efforts, in co-operation with similar associations in the other States, to secure the safe carriage of fruit to oversea markets.

The various Fruitgrowers' Associations are asking the shipping companies to agree to carry fruit at a uniform temperature of not less than 32 deg. Fah. or more than 38 deg. Fah.; to permit self-registering thermometers to be placed in each hold; to deliver the fruit within a specified time; and to be responsible for ullage by the ships' companies. In view of the heavy freights charged for fruit, these requests cannot be regarded as other than reasonable.

The following figures concerning the fruit shipped by the Produce Depot last season will be of interest:—

S.S. SARPEDON—1,355 cases of apples realised 4s. 7d. per case net at Port Adelaide; cost of case and packing, which would amount to about 1s. 2d., must be deducted, leaving 3s. 5d. per case for the fruit. The prices realised by the different consignors varied from 2s. to 8s. 5d. per case at Port Adelaide. One hundred and fifty-one cases of pears, mostly overripe and wasty, netted 2s. 5½d. at Port Adelaide.

S.S. HECTOR—1,409 cases of apples averaged 10s. 6d. in London, equal to 5s. 11d. at Port Adelaide. The Cleopatras averaged 10s. 4d.; Jonathan, 11s.; and Dunn's Seedling, 11s. Many of the Cleopatra apples were "spotty," and consequently lowered the average. Fourteen cases of pears realised 7s. 8d. gross, 3s. 11d. net. Most of the pears were unsound. Some that arrived in good condition realised 20s. per case.

S.S. WARRIGAL—Owing to the temperature of the chambers being allowed to get too high, the fruit was mostly landed in very bad condition. The shipment realised an average of 4s. per case in London. The returns at Port Adelaide varied from a net return of 2s. 2½d. to a loss of 2s. 2½d. per case, besides cost of case, paper, and wood wool. The rebate of 1s. 6d. per case allowed by Lund & Co., in all but one instance, has prevented any actual loss, other, of course, than the value of the fruit.

Account sales of shipments ex Orestes and Commonwealth have not yet come to hand, but it is anticipated from telegraphed reports that the returns owing to the depressed markets, will be unsatisfactory.

MOTIVE-POWER IN SPRAY OUTFITS.

By W. L. SUMMERS.

The general adoption of the practice of spraying with arsenical mixtures for the suppression of the codlin moth has brought home to our fruitgrowers the absolute necessity for efficient spraying outfits. It is generally recognised that the outfit must be of such character as to permit of the work being efficiently and at the same time rapidly carried on. The time occupied in spraying is a very important item, especially to those apple-growers who also produce considerable quantities of soft fruits. This is particularly apparent during the early summer months, when it is essential that spraying for codlin moth should be undertaken at the right time—if necessary at the sacrifice of other duties—if the best results from previous operations are to be secured. At this period spraying cannot possibly be neglected, except at great risk to the crop, yet the grower is usually very busy harvesting his soft fruits.

So far as I am aware all spray outfits used in South Australia are worked by handpower. The question arises: Cannot other power be applied to secure greater efficiency and also economy of time and money? Mr. C. B. Simpson, Special Field Agent to the United States of America Department of Entomology, dealing with this question, says—"If an orchard consists of more than 1,000 trees, it will be found expedient to use a gasoline-power spraying outfit. If the orchard consists of 5,000 to 10,000 trees it will be found that the expense per tree with this outfit is only about half of what it would be with hand-power sprayers." Much, of course, will depend upon the character of the orchard, as on steep hillsides the larger outfits could not be worked. That the above statement is, however, founded upon actual work is evidenced by the number of makers in America who have placed gasoline-power sprayers on the market and the numbers that are in actual use. Mr. Simpson states that the engine for spraying purposes should be about one horsepower, which may, perhaps, be more than is required at ordinary times; but occasions may arise when more power would be desired. The whole machine, engine, pumps, and tank, must be mounted upon a rigid frame. On this frame there should be a platform on either side, with railing, for the operators. Fig. 3 of the illustration shows the outfit. This frame can be mounted on an ordinary wagon, but it is preferable to use a low wagon, with steel wheels and tires not less than 6 in. wide. A team and two men are required to work this outfit; both spray, and one drives while the other stops and starts the engine. Many tests of these outfits show that 700 trees can be sprayed in one day, and some growers have sprayed as many as 900 trees in a day. The engine fills the 150-gallon tank in about four minutes, and can empty it at the rate of $2\frac{1}{2}$ gallons per tree in 30 to 40 minutes. The outfit complete, with special wagon, costs from £55 to £110, according to size, etc. That shown in illustration cost about £66, including £8 for wagon and £4 for filling pump and attachments.

The following figures, showing the cost of spraying 1,000 large eight-year-old trees, using $2\frac{1}{2}$ gallons per tree of the arsenite of lime, are taken from a recent report by Mr. Simpson on the subject of codlin moth:—

HANDPOWER OUTFIT.

Man and team, 4 days, at \$3.50	...	...	...	...	...	...	\$14.00
Two men spraying, 4 days, at \$1.50 each	...	...	...	...	...	...	12.00
Materials	...	...	...	...	...	...	1.12

[illegible]

Say, £5 15s.

GASOLINE-POWER OUTFIT.

Man and team, 1½ days, at \$3.50	... ..	\$5.25
One extra man, 1½ days, at \$1.50	... ..	2.25
Materials	... ..	1.12
Gasoline	... ..	.55

[illegible]

Say, £1 19s.

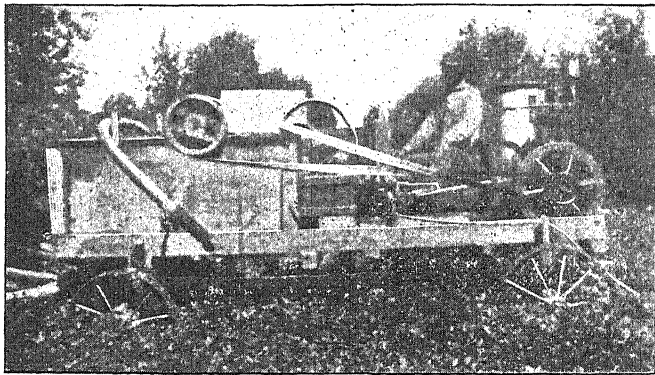


Fig 1.—Gasoline-power Sprayer, showing the Engine and Spray-pump

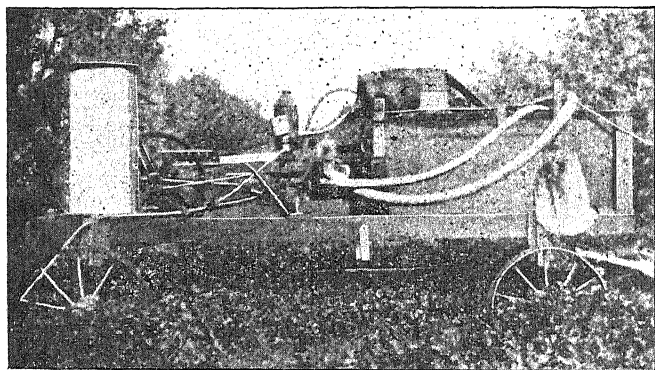


Fig. 2.—Same Sprayer as No. 1, seen from the other side; showing Filling-pump and Attachments.

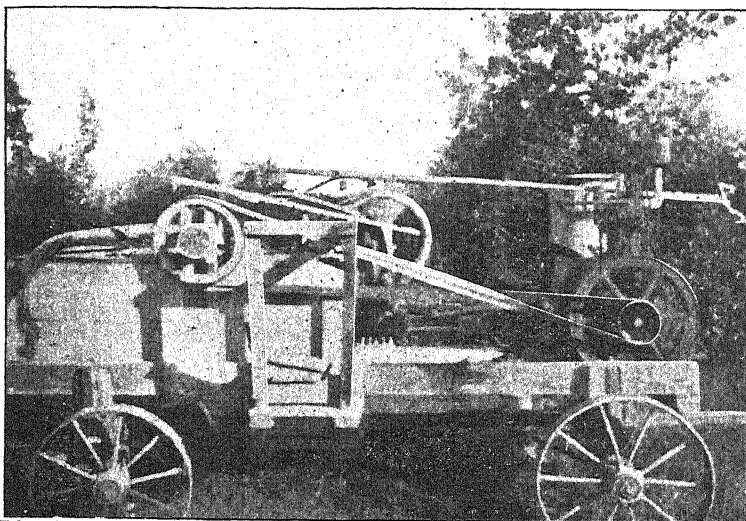


Fig. 3.—Gasoline-power Sprayer as it was improved during the season.

These estimates were taken upon actual field operations. By the hand-power outfit it cost 2.7 cents per tree, and by the gasoline-power outfit 0.9 cents, allowing market rates for labour and team, but the actual additional cost to the grower would not be more than half these figures.

The first cost would, of course, be the greatest drawback to the adoption of these gasoline or similar power spraying outfits, but I believe that it will not be many years before our larger growers who are working orchards on not too steep slopes will find it profitable to use them. There is no doubt, too, that once the gasoline engine is purchased it could be used for many purposes, such as pumping water, cutting chaff, and for other purposes where the power is sufficient.

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a **REGISTRATION FEE** of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

AGRICULTURAL STATISTICS, 1903.

The preliminary tables issued by the Government Statist showing the harvest statistics for 1903-4 are, on the whole, of a very satisfactory nature. In all the more important branches considerable increases are shown in the returns.

In Table I. are shown the returns from cereal crops for 1903-4, compared with those of 1902-3.

It will be seen that the total yield of wheat was 13,209,465 bushels, as against 6,354,912 bushels the previous year, and the average yields per acre were 8.29 bushels and 5.98 bushels respectively. The aggregate yield has only been exceeded twice during the past fourteen years, viz., 1889, when the record was 14,577,358 bushels, and 1893, with 13,618,062 bushels. Neither barley nor oats figure very largely, compared with wheat, in the returns, the total yield of barley being 487,920 bushels, an average of 17 bushels per acre, and oats, 902,936 bushels, an average of 15.67 bushels per acre.

Owing to so many of the crops being attacked by red rust a greater area than usual was cut for hay, last year's figures showing an increase of 44,363 acres, and an increased yield of 170,898 tons. The average yield of 1.3 tons per acre is the heaviest recorded for many years.

TABLE I.—CEREAL CROP STATISTICS.

Division and County.	Wheat.			Barley.		Oats.		Hay.	
	Acres Sown.	Acres Reaped.	Total Produce.	Acres.	Total Produce.	Acres.	Total Produce.	Acres.	Total Produce.
I. CENTRAL.—									
Adelaide	15,510	15,510	Bushels.	2,358	Bushels.	1,529	Bushels.	60,387	Tons.
Albert	32,458	31,792	164,160	110	37,980	740	26,245	2,549	94,250
Alfred	14,802	14,432	177,200	—	1,130	56	8,540	1,364	2,150
Carnarvon	120	120	105,985	—	—	720	1,215	1,452	1,364
Eyre	98,160	93,718	1,250	2,833	52,620	689	11,582	610	762
Fergusson	113,085	113,085	672,934	815	14,620	13,563	11,786	12,173	11,676
Gawler	110,126	95,380	1,170,645	4,102	71,490	4,730	175,210	16,700	18,163
Hindmarsh	12,156	12,156	1,023,568	1,792	27,613	3,632	65,178	39,647	57,864
Light	101,512	81,087	123,514	3,719	56,184	2,417	54,785	10,823	13,614
Sturt	66,565	64,636	912,435	2,137	53,725	3,192	47,914	41,150	58,682
			454,742	1,082	17,218		42,836	12,187	12,140
Total, 1903-4	564,494	521,916	4,806,433	18,948	332,580	31,268	445,285	197,680	270,665
„ 1902-3	522,673	384,900	2,921,152	14,212	189,458	27,704	280,437	197,100	205,546
II. LOWER NORTH.—									
Burra	29,450	27,452	192,780	173	3,027	210	3,248	4,217	4,314
Daly	204,156	191,838	1,735,718	580	10,218	3,780	55,226	23,900	27,176
Hamley	—	—	—	—	—	—	—	283	350
Kimberley	28,295	26,134	180,653	55	1,088	94	1,484	2,315	2,027
Stanley	130,153	120,623	1,441,892	750	12,619	1,704	27,193	25,327	34,285
Victoria	145,147	125,397	1,512,893	520	9,865	1,274	21,358	41,230	60,232
Young	3,725	3,725	18,760	145	1,285	285	2,436	410	410
Total, 1903-4	540,926	493,169	5,082,696	2,223	38,102	7,347	120,945	97,682	128,794
„ 1902-3	539,521	386,268	2,351,692	1,409	16,558	6,000	47,649	87,610	65,114
III. UPPER NORTH.—									
Blackford	8,600	8,022	26,160	—	—	—	—	430	376
Dalhousie	138,944	137,240	923,942	93	2,186	183	5,178	16,715	17,163
Derby	—	—	—	—	—	—	—	—	—
Frome	137,920	123,826	827,902	—	—	—	—	19,270	20,125
Granville	43,720	42,527	87,450	—	—	—	—	554	397
Hanson	15,245	15,245	40,672	—	—	—	—	—	—

[illegible]

The figures concerning the fruit and vine growing industry are also satisfactory, as shown in Tables II. and III. :—

TABLE II.—HORTICULTURAL STATISTICS.

Division.	(Garden, exclu- sive of Vines.	Orchard. Acres.	Almond Trees.		Apple Trees.		Orange Trees.		Lemon Trees.		Olive Trees.	
			Number.	Produce. Cwts.	Number.	Produce. Cwts.	Number.	Produce. Cases.	Number.	Produce. Cases.	Number.	Oil made. Galls.
CENTRAL— 1903-4 ... *Increase or +de- crease on 1902-3	Acres 7,217 *329	Acres. 14,170 *1,022	139,018 *12,248	5,675 *900	469,578 —	283,926 —	124,572 *13,717	90,194 *32,117	52,396 *4,108	34,517 *12,697	62,723 *1,428	11,344 *722
LOWER NORTH— 1903-4 ... *Increase or +de- crease on 1902-3	1,275 *70	2,562 *42	21,495 *211	321 461	65,682 —	17,168 —	13,225 *412	6,048 *2,156	13,578 43,850	5,505 *360	12,562 *127	520 +1,280
UPPER NORTH— 1903-4 ... *Increase or +de- crease on 1902-3	691 *20	753 *135	9,489 471	337 *113	18,720 —	10,942 —	3,074 *4	1,394 *638	529 *12	147 *55	1,120 *310	— —
SOUTH-EASTERN— 1903-4 ... *Increase or +de- crease on 1902-3	664 *39	1,154 *96	7,368 *872	252 466	31,963 —	14,248 —	775 49	81 48	1,294 *44	146 *146	2,365 *23	— —
WESTERN— 1903-4 ... *Increase or +de- crease on 1902-3	117 *17	86 *54	1,165 —	— —	274 —	40 —	210 430	— —	85 *11	— —	1,790 *30	— —
Grand Total, 1903-4 ... *Increase or +decrease ...	9,964 *475	18,725 *1,349	178,535 *13,260	6,585 *886	586,217 —	326,324 —	141,856 *14,094	97,717 *34,903	67,882 *325	40,315 *13,258	80,560 *1,918	11,864 4558

It will be noticed that there has been a gratifying increase all around in the totals, and, with one or two exceptions, in each district. In the Lower North small decreases are shown in number of almond trees and yield of olive oil, and a large decrease in number of lemon trees. The latter is *apparently* explained by the uprooting or death of lemon trees at Renmark and the village settle-

ments, as the total for the County of Hamley accounts for practically the whole deficiency. The number of apple trees and the yield are shown for the first time and indicate the great importance of the apple industry to the State. Allowing that the orchards average 100 trees per acre we have 5,862 acres under apples, out of a total of under 39,000 acres of garden and orchards of all descriptions. The figures concerning olive oil do not show the total for the State, as manufacturers who buy olives but do not grow any are not required to furnish returns. The total would be several thousand gallons more than the figures quoted.

TABLE III.—VITICULTURAL STATISTICS.

Division.	Total Acreage of Vines.	Number of Vines in Bearing.	Number of Vines not in Bearing.	Quantity of Wine made in 1903 Vintage.	Grapes Sold.	Raisins Made	Currents Dried.
CENTRAL— 1903-4 *Increase or †decrease on 1902-3 ...	Acres. 18,312 *670	8,711,236 *216,094	1,378,180 *84,711	Gallons. 2,196,760 *175,255	Cwt. 225,726 *16,798	Cwt. 2,785 *614	Cwt. 6,714 *3,965
LOWER NORTH— 1903-4 *Increase or †decrease on 1902-3 ...	3,427 *236	1,261,246 *76,493	398,400 *46,332	112,955 *10,315	25,416 *6,361	10,210 *872	3,657 *1,585
UPPER NORTH— 1903-4 *Increase or †decrease on 1902-3 ...	243 *7	86,440 *172	10,610 *930	300 —	2,857 *84	68 *35	35 *30
SOUTH-EASTERN— 1903-4 *Increase or †decrease on 1902-3 ...	563 †14	303,664 *14,664	47,640 †16,760	35,255 *14,175	6,545 *1,443	— †20	— †50
WESTERN— 1903-4 *Increase or †decrease on 1902-3 ...	72 *26	18,340 *6,364	18,980 *14,810	— —	— †90	— —	— —
Grand Total, 1903-4 *Increase or †de- crease on 1902-3	22,617 *925	10,380,926 *313,787	1,853,810 *130,023	2,345,270 *199,745	260,544 *24,596	13,063 *1,501	10,406 *5,470

It will be seen that the grand totals show increases on every item, and, except in the South-Eastern District, each division shows increases throughout. In that district the figures indicate a total decrease of 2,000 vines, representing 14 acres. Owing to the statistics being collected in March, the vintage returns are eighteen months old. The increase in the output of currants is very marked, viz., from, 4,886 cwt. in 1902-3 to 10,406 cwt. in 1903-4.

At the ruling price of 3½d. per lb. the growers realised this past season £18,817 10s. 4d. from their currants.

In live stock the total number of horses recorded is 176,648, an increase of 12,023; milch cows, 83,348, increase 8,337; other horned cattle, 161,262, increase 22,930; sheep, 5,298,720, increase 418,180; pigs, 88,246, increase 5,469; poultry, 1,385,923, increase 104,730. The amount of cheese made is returned as 940,584 lb., increase 234,615 lb.; and of butter, 5,995,756 lb. made, showing an increase of 1,474,510 lb.

COMMERCIAL RESULTS OF POULTRY FARMING.

By J. VON BERTOUCHE, Kapunda.

At the General Congress of the Agricultural Bureau held in September, 1903, I read a paper on poultry farming, and gave the financial results for the first year of my poultry farm at Kapunda. Hereunder I give the results of the second year, which may be interesting to those concerned in the poultry industry, and which prove that, with proper attention, poultry will pay even where practically all the food has to be purchased. I am absent from home half of every week, and can only attend to the management of the poultry farm before and after office hours, and keep only a lad who attends to feeding the birds and cleaning the yards, houses, etc.

Results from August 1, 1903, to August 1, 1904, are as follows:—

RECEIPTS.

Sales of eggs	£84 12 10
Sales of birds	16 14 3
Estimated value of eggs used at home	5 4 0
Value of increase of stock	6 5 0
Show prize money	7 8 0
Sundry receipts	1 3 4
	<hr/>
	£121 7 5

EXPENDITURE.

Cost of food	£43 4 7
Birds and sittings of eggs bought	7 4 6
Show expenses	2 19 9
Carriage, commission, etc.	4 3 7
Materials bought	2 13 0
Labour (half time of lad)	7 10 0
	<hr/>
	£67 15 5

Profit, £53 12s.

The stock consists of 237 birds, of which 20 are cocks and 217 hens. Gross return per bird, 10s. 3d.; average cost per bird, 5s. 9d.; net profit per bird (including cocks), 4s. 6d.

The result is better than that of the first year, as given in *The Journal of Agriculture* of October, 1903.

The capital involved is approximately £100, and I maintain that on a larger scale, with little extra expense and labour, proportionately better results may be obtained, especially if proper attention is given to the selection of the best laying strains. The egg-laying average of a large flock can be much improved on by selecting the best layers and breeding from such only. The egg-laying competitions which are being held are good object lessons, and do good by creating interest in the poultry industry. Last year the average return of eggs from my flock was about 120 eggs per hen, whereas my pen of birds at the last egg-laying competition averaged 167 eggs per bird, although I selected that pen from my flock at home only by my idea of appearance of a good layer. Since then I have selected by closer observation the best layers from all my birds, and have penned them with roosters from well-known laying strains, for the purpose of improving my own flock, and I am confident that by this means I can increase the egg-laying capabilities of my fowls materially.

[In commercial poultry keeping it would be absolutely necessary to allow at least 10 per cent. for depreciation of sheds, netting, etc., as well as interest on the capital outlay. This would reduce the gross profit shown by Mr. von Bertouch to the extent of from £10 to £15.—ED.]

FEEDING CHICKENS.

Written for *The Journal of Agriculture*.

By D. F. LAURIE.

The future of a fowl depends largely on the treatment meted out to it during the first few weeks of its existence. If neglected or improperly fed at first it is seldom, if ever, that the chicken develops into a fine bird. This is the universal teaching of all authorities, and is the result of accumulated experience. It matters not particularly whether the chickens are in the care of a natural mother (a hen, or turkey hen, or capon), or whether reared artificially in one of the many excellent brooders or artificial mothers which are now available at a moderate price. On this subject I may state that, whereas until quite recently the brooders or artificial mothers available were of such inferior design that they proved veritable deathtraps, and could not be recommended, now, however, in addition to American-made brooders, some of our local manufacturers are turning out most excellent machines at a reasonable price. With a sufficient number of these machines one can dispense with hens and rear a larger percentage of healthy, vigorous chickens. On a future occasion, time may permit of an article on the various brooders. Chickens left to the care of hens must be frequently examined for vermin, as, if such are allowed to multiply, losses will occur. Incubator hatched chickens reared in brooders do not suffer from this trouble. The hen should be confined in a fairly roomy coop, which, in addition to providing shelter from wind and rain, should be so constructed that it can be rendered cat and rat proof at night without much trouble. This is a most important matter, as will be seen later on. Very few chickens can stand the amount of exercise a vigorous hen would give them, if allowed to roam about; at any rate, for the first week. The practice of tethering the hen near a shelter coop, and allowing the chicks their liberty, answers very well with quiet hens; but some resent it fiercely, and fret a great deal. A leather strap of fair width, and pliant, should be fastened around the shank, and a piece of strong string attached thereto.

Chickens up to a few weeks old are of much service in flower gardens, or even in vegetable gardens and orchards at greater age. They eat large quantities of insects, many of which, if unchecked, work great havoc in the gardens. This form of food is an excellent addition to the usual chicken food. If the birds are to be reared in large numbers, ample provision must be made in the way of coops, yards, etc., and a few extra should be provided for emergencies.

In from twenty to twenty-four hours after hatching the chick does not require food—Nature has provided for that period—and to force food on chicks may result in harm. There is generally one chick more forward than the rest which will be calling loudly for attention before the lapse of the conventional twenty-four hours, and such a bird does not take very long learning to eat. The question of foods is one that has been debated for many years. In former times great value was attached to hard-boiled egg—a food I discarded years ago, as I found it caused bowel trouble. A few writers recommend it for the first day only; but the majority condemn it altogether. Raw egg well beaten, with fresh skim or separated milk, and used for mixing with roughly ground grains, or even chick meal, is an excellent food for a day or so, or for occasional use, with weakly or backward chickens.

For the first month my practice for many years has been to use hard food only. This consists of wheat, maize, peas, lentils, millet, and, if obtainable, hulled oats and pearly barley—the latter two excellent foods are obtainable in Adelaide. For years I endeavoured to get properly ground oats and barley meal; but owing to the practice of grinding only inferior samples, which had far too great a percentage of husk, I gave up such foods. Even the best oats and barley contain so much husk that there is great danger of impaction; while the husk is indigestible, and of no value as a food. For older birds, if properly ground, it adds bulk to the food, and aids the process of mixing. I use a mill set to crack a grain of wheat into quarters. This will serve for all the grains mentioned, although most of the millet passes through. A day's supply may be ground overnight and sifted, so as to separate the meal and finer portions. For this purpose a wire dishcover answers exactly, or a sieve of that material may be specially made. Sunflower seed may be added occa-

sionally; but care must be taken that all the seeds and grain are fairly cracked. The meal can be accumulated in a bin for use later on, or for chickens after they are a month old. This mixture should be fed on feeding boards every two hours for the first month or six weeks, after which a period of three hours may intervene. This is the "little and often method," for it must be understood that each meal should consist of just as much, and no more than the chicks will readily eat. Over-feeding and irregularity in time of meals will end in disaster.

I like covered coops for chickens, so that in wet weather the floor may be dry. The floor, or ground, should be strewn with clean, short straw or wheat chaff, and in this grain and grit should be scattered, so as to provide exercise, which keeps the birds active and warm, and promotes a healthy condition. Birds so treated seldom, if ever, ail or mope.

In mixing the various grains, if all are obtainable, I should suggest:—Wheat, 3 parts; hulled oats, 3; pearled barley, 2; peas, 1; maize, $\frac{1}{2}$; lentils and millet, mixed, $\frac{1}{2}$; making 10 parts. Sunflower can be used occasionally in place of lentils. Other mixtures may be of wheat, barley, and oats, each 1 part; maize and peas, half a part of each. If a staple is to be adopted, let it be wheat; but it is advisable to procure as good a variety of grains as possible, as they differ in constituents. Sound food, in proper quantities, at regular hours, is of more importance than fussing about to know if the exact measure of proteids, albumenoids, and other such food constituents are being provided. Those who are inclined to pay great attention to analysis and "balancing rations" may bear in mind that certain substances may give a very different value as actual food than would be supposed from the analysis thereof. We see tables of the food value of bran, pollard, wheatmeal, oatmeal, and the various grains, and those who lack experience at once think those figures apply to all similar meals, grains, etc. This is not the case. Average South Australian wheat offers a different analysis to European or American wheat, and even samples of our wheat vary very considerably. Mill offal—that is, bran and pollard—vary in food value according to supply and demand of flour. Prime oats and barley grown elsewhere give different tables to the very best we can produce in this State.

The question of drink for young chickens has also formed the subject of much debate, and there are two schools; one school gives water in varying quantity, some *ad lib.*, others a good drink night and morning. The other side never allows the birds to drink water or milk during the first month of their existence; if they obtain a little dew from the vegetation in the early hours of the day, it is all they have. Good results from this method are reported; but in a dry climate such as ours the chicks certainly require drink, more so if fed, as suggested, on hard grain food only. Some writers give alternate meals of soft and hard food. This I do after a month; but by using hard food, and encouraging the chicks to scratch, I find a complete absence of bowel complaint. I allow unlimited water, taking every precaution that a full supply of fresh, clear, cool water is always at hand. If the chicks suffer from thirst, and then drink to repletion, there is a strong likelihood that bowel troubles, or disorganisation of the digestion, will follow.

Fine quartz grit is always kept in the runs, and, in addition to some in a small flat tin dish, I scatter some in the litter; sometimes the chicks will not eat it from the dish.

American methods are generally noted with interest nowadays, for the breeders there are certainly very practical. I note that many of the breeders there adopt the hard food system I have so long advocated. Others use a good deal of what they call "johnny cake," which is similar to some of the so-called biscuit used in England. This "johnny cake" is composed of one-third bran, two-thirds corn (maize) meal, with a little meat, well mixed with water or skim milk, and baked. As the chicks grow older the meal is increased and the bran decreased. Clear eggs from the incubators are also beaten up and mixed in the cake. A good deal has of late been written on the subject of maize as a food for poultry. English experience is and has for years been against any but the most moderate and occasional use of maize. It is claimed that the process of cooking alters the chemical composition of maize, and renders it an excellent article of food. Its immoderate use tends to sluggishness and bowel trouble in poultry, both young and old.

GREEN FOOD, MEAT, WORMS, ETC.

I know of many instances where fair birds have been reared without green food of any sort. There is no question, however, of its value, and in 99 cases out of 100 the absolute necessity of green food, if success is to be assured, must be recognised by every breeder of chickens. What is known as barley grass seems most relished by poultry. This, however, only grows during the cool season, and will not stand heat. All the cabbage tribe are excellent, not only for green food, but are of great value as food. This green is an egg producer. Thousand-headed and Jersey kale are two that can be recommended, and are both relished by the birds. Lettuce is of great value, especially during hot weather. These all require fairly rich soil, and a certain amount of water. Rape is at once one of the best and easiest to grow of all green foods for chickens. The best method I know of is that adopted by a friend of mine. Small portable frames, according to requirements, are made and covered with 1½-inch to 2-inch wire-netting. A handy size is 8 feet long, 3 feet wide, and 6 to 8 inches high. These are to cover plots of rich ground on which rape seed is sown, and kept well watered. Five or six frames may be needed, so as to give a succession. The beds of rape can be sown in the chicken runs. While the rape is growing to say 4 inches in height, birds are denied access to it. After that period they are allowed to help themselves through the wire-netting shield, which prevents them from scratching and trampling: so that after a frame is fed off it may have a rest. Common nettles are excellent when boiled: the nettles and liquor in which they are boiled are both mixed with the soft food, or may be given alone. Green food should be given regularly. If the supply is limited, give a little daily; if ample, give as much as they will eat. If birds are left without green food for a time, and then have a surfeit, trouble may result. For very young chickens the green food should be cut small (¼-inch lengths), with a pair of scissors or a sharp knife, and some should be mixed with the soft food (if used). A sod of fresh, green grass is much enjoyed by chickens in confinement.

Great stress is laid by most writers on the value and necessity of animal food to supplement or take the place of insect food. During a great part of the year the practice of hoeing or forking a small plot of ground in the runs or elsewhere will provide a supply of worms, grubs, etc. For young chickens this is the best form, and is most strengthening, and ill results never follow. Meat may be used sparingly (in place of insect food) while the chicks are young. Liver, scrap meat, bones, etc., may be boiled; the soup is valuable for mixing with soft food for both young and old birds, and the meat may be minced and fed either in soft food or alone. A moderate amount is the safe course, and all meat, etc., must be perfectly fresh and free from taint. Green cut bone should never be used until the chicks are at least a month old; even then it is apt to cause bowel trouble. Use this food in moderation; as a rule, it is very forcing.

In managing all young feathered stock overcrowding must be guarded against. Young birds must have plenty of room, and will not thrive on tainted ground. Keep the coops and brooders constantly on the move. Sort your birds into sizes, and remove any bullies on the one hand, or weakly birds on the other. The presence of a bully is detrimental to the flock. The weakly birds may take a turn if cooped by themselves or with a smaller-sized chick. Examine frequently for vermin (if hatched by a hen); use kerosene 1 part, oil 4 parts; or the best insect powder. As the chicks grow they will appreciate a dust bath, which will cleanse them of vermin, and assist feathering.

Great loss is due to the depredations of rats and cats. The rat is a sly animal, and is sometimes difficult to trap. If his hole can be discovered, dig him out in the presence of a good cat or a sharp terrier. Where they abound, or where native cats are troublesome, it is necessary to have double fronts to all coops; use ½-inch netting, and allow a space of 3 inches between the two pieces. Otherwise rats and native cats can get their paws through the fine netting, and claw the chicks to death. A well-trained terrier is the best guard: only first assure yourself that the terrier is above suspicion as regards chicks. Domestic cats cause great loss; your own cat by day may allow chicks to run all over him; at night he may effectually house them. Other people's cats may be caught in box-traps, and dealt with. Under no circumstances should poison be laid.

In some country districts hawks are troublesome. Where such is the case, erect a post about 10 feet high near the coops; on top of this place an ordinary rabbit-trap. Hawks generally alight on a point of vantage such as this. This method has proved effective elsewhere.

Keep the birds well fed and exercised. As they grow, move them on to other quarters. It pays well to give the best attention to birds, as neglected birds cost more and realise less than good ones.

I have not dealt with the question of soft food. Those who still prefer that method will find that by grinding the grains mentioned, and in the same proportions, they will get an excellent chicken meal, which should be well scalded with either water or skim or separator milk. Separator milk is of great value for feeding poultry. Bran and pollard are commonly used; but as they vary so much in quality, the proportions must be left to the reader. The bran is of value chiefly to make the soft food friable, for although its analysis is good, its food value for poultry is not in accordance. Anyone who can obtain clover or lucerne hay, and can get it ground, will have a valuable food, which should be scalded and left to steam, and mixed with the soft food. The great danger of too much soft food is that the birds overgrow their strength. In the inordinate desire for size, the birds are rendered delicate and unfit for any purpose except for table. The most satisfactory method will prove to be hard food for a month, then alternate meals of soft and hard; and when the birds are well grown, gradually get them on to hard food, with perhaps one meal a day soft food. This method is for layers, and stud or breeding birds.

NOTES ON ROSEWORTHY EGG-LAYING COMPETITION.

By W. R. DAY.

The Royal Agricultural and Horticultural Society of South Australia having decided upon holding a second egg-laying competition, a site was selected in the carob plantation at the Agricultural College, Roseworthy. The Society had men early in May arranging the pens in four rows, running north and south, with a passage way between each two rows. The pens measure 24 ft. by 24 ft., and have been so arranged to enclose three carob trees in each, which have proved a great source of comfort to the fowls by affording shelter from the rough, cold weather experienced during the winter months, and will also provide shade during the summer.

The fowls arrived on May 11, and had four days allowed them in which to settle down. The competition started in real earnest on the morning of May 15, 1904, and will finish on the evening of May 14, 1905. There are thirty-one pens, and each contains six hens or pullets, mostly good specimens of the breed they are representing, and, taken right through, a very even lot. As the competition is being conducted for egg production only, the male bird is an absentee. The different breeds are represented as follows:—

White Leghorns	...	...	5 pens	Black Orpingtons	...	...	3 pens
Brown Leghorns	...	...	3 "	Minorcas	...	...	3 "
Buff Leghorns	...	...	3 "	Silver Campines	...	...	2 "
White Wyandottes	...	...	2 "	Black Hamburgs	...	...	1 "
Golden Wyandottes	...	...	2 "	Langshans	...	...	1 "
Silver Wyandottes	...	...	2 "	Black Spanish	...	...	1 "
Buff Orpingtons	...	...	2 "	Ancona	...	...	1 "

The birds arrived here in a nice healthy condition, and, with four exceptions, came up to the Society's regulation in regard to cleanliness, and these exceptions were not affected to any great extent. I am pleased to be able to report that up to the present time they have continued in good health. So far I have had only one death to report, and this occurred during the first week. Some of the birds have moulted rather badly since their arrival here, and that, with the very unsettled weather conditions which have prevailed, is, I think, the reason why the birds generally have not shown to better advantage. Some, again, were very young, and have spent most of their time putting on natural growth and development, instead of being in

the condition and at the age for egg production from the start. These, however, may show to better advantage later on, and it would be a very hard matter to foretell what may happen before the end of the twelve months of the competition. Of course, those birds that have been laying well from the start have got a good hold on the prize for market value, as although eggs have not brought such high prices in Adelaide as have obtained in the other States during the winter, prices now are much lower. Consequently the later starters in the laying business will require to do well indeed to overtake the present leaders.

Upon arrival here each lot of fowls was weighed, and at the end of three months I weighed two from each pen and took their weight as the average for each lot. It will be noted that the majority of pens of birds have put on a little extra weight, which should be in their favour when they set to work in earnest in the production of eggs, which I hope will show a considerable improvement in the next report.

The attached table gives the average weights of the birds on May 15 and August 14, and the egg yield to August 28:—

No. of Pen.	Breed.	Owner.	Average weight of Birds on May 15.		Average weight of Birds on August 14.		Eggs laid May 15 to July 31.	Eggs laid Aug. 1 to 28.	Total May 15 to Aug. 28.
			lbs.	ozs.	lbs.	ozs.			
4	White Leghorn ...	Sunnyhurst Egg Farm	3	14	4	0	273	114	387
17	Silver Wyandotte	Smith, W. A. E. ...	3	13	4	4	258	74	332
1	White Leghorn ...	Butler, Mrs. S. ...	3	10	4	3	197	116	313
9	Buff Leghorn ...	Foot, C. ...	2	11	3	7	193	71	264
18	Buff Orpington ...	Balfour, J. G. ...	5	5	5	6	151	76	227
24	Minorca ...	Penglas Bros. ...	3	11	4	4	140	60	200
21	Black Orpington	Tyler, A. H. ...	4	12	6	0	95	87	182
31	Ancona ...	Russell, Dr. H. H. ...	2	12	2	8	88	93	181
29	Langshan ...	Hassell, G. ...	5	11	5	8	89	68	157
2	White Leghorn ...	Crompton, T. E. ...	4	14	5	3	109	31	140
19	Buff Orpington ...	Laidlaw, R. ...	5	14	5	8	93	35	128
7	Brown Leghorn ...	Marshall, H. P. ...	3	9	4	0	45	76	121
20	Black Orpington	Chart Trading Co. ...	5	11	5	14	77	41	118
12	White Wyandotte	Bennett, W. C. ...	3	15	4	2	69	45	114
10	Buff Leghorn ...	Sargenfri Poul. Yards	3	9	4	0	38	73	111
16	Silver Wyandotte	Robson, T. B., & Son	4	7	5	8	25	77	102
27	Silver Campine ...	Smith, J. ...	3	8	3	8	53	40	93
28	Black Hamburg ...	Fulwood, P. & A. ...	2	14	3	4	48	43	91
25	Minorca ...	Alfalfa Poultry Yards	4	6	4	8	52	38	90
30	Black Spanish ...	Kluge, J. ...	3	1	3	0	58	24	82
5	White Leghorn ...	Padman, A. H. & J. E.	3	15	3	8	31	38	69
11	Buff Leghorn ...	Yelland, T. E. ...	3	9	4	2	18	47	65
26	Silver Campine ...	Hobbs, J. H. ...	3	9	3	8	62	—	62
22	Black Orpington	Wimble, F. J. ...	7	3	7	5	48	14	62
15	Golden Wyandotte	Muecke, L. H. ...	3	2	4	0	40	13	53
13	White Wyandotte	Pugh, H. M. ...	4	1	5	4	17	36	53
8	Brown Leghorn ...	Hunter, J., jun. ...	3	8	4	5	19	15	34
6	Brown Leghorn ...	Hammatt, W. D. & L. T.	3	4	3	15	2	28	30
3	White Leghorn ...	Dean, W. S. & T. E.	5	1	5	3	7	13	20
14	Golden Wyandotte	Mellor, P. W. ...	3	14	4	0	—	17	17
23	Minorca ...	Bower, J. ...	4	10	4	11	6	—	6

Acting under instructions received from the President of the Society, the feeding of the birds has been conducted as follows:—

Morning Meal, 7 o'clock.—Bran and pollard, mixed with crushed liver and hot liver soup two mornings each week, and bran and pollard mixed with hot water the remaining five mornings.

The midday meal consists of a liberal supply of green feed, which is changed in variety as often as possible. Kale, rape, cabbage, grass and

thistles, and lucerne being available, a change is made nearly every day. A quantity of bones and scraps crushed is also given for this meal.

Evening meal, 4.30 to 5 o'clock.—Grain, as follows:—Crushed maize, wheat, Cape barley, oats, crushed peas, and torrefied barley, varied each evening.

The feeding is conducted according to the appetite of the birds, some pens requiring more than others. Food is never supplied in such quantities that any is left lying about in the pens, but preferably the birds are just a little bit hungry. A patch of ground is always kept loose in each pen, on which the feed of grain is given, so as to induce the fowls to scratch and search for wheat, etc., for a considerable time each evening, to afford exercise for them. A round of the pens is made each evening at 5 o'clock for the collection of eggs.

A fresh supply of water is placed in the shade in each pen every day, and the following mixture of grit is always kept in each house:—Shell grit, ground oyster shell, and quartz grit. The birds are caught about once a month and dusted well with insectibane, and houses and yards are thoroughly cleaned every day.

STRANGLES.

[The following notes are published in response to a request for symptoms and treatment of this complaint.—Ed.]

An eruptive fever peculiar to horses, usually affecting their organs of respiration to a greater or less extent, with the formation of a hard tumour in the sub-maxillary space. It is peculiar to youth, generally attacking animals from two to six years of age, yet may occur in a sucking colt or in a horse of twenty years, but such cases are exceptional. It never attacks the same animal again, excepting very young colts or foals. In malignant cases tumours form sometimes in the groin, behind the shoulder, and not infrequently in the intestines or mesentery, where it is extremely difficult or impossible to get at it. Sometimes an animal, while appearing to be in a perfectly normal condition otherwise, will be noticed to move stiffly, and on examination a tumour will be found inside of the thigh.

Contagion is said to be a common cause, and, under certain circumstances, it, no doubt, is. It often runs through a stable, affecting every animal in it. Impure air, poor keep, or anything that tends to debilitate, certainly has a tendency to aggravate, if not actually produce, an attack of strangles. Removing horses from open pastures to close stables, being a change from a cold to a warm place, produces the disease more readily.

Symptoms of strangles in an early stage of the disease are frequently somewhat similar to catarrh. For days the animal appears dull, languid, and weak, and the appetite is impaired. The first decided symptom is that of difficult deglutition, and an elevation of the temperature takes place. The head is kept in a stiff position, and on attempting to turn, the animal moves around with difficulty. The pulse is usually weak, coat staring, bowels constipated, and the faeces covered with mucus. Salivary secretion is largely increased. A careful examination should be made, and if strangles, there is observed the formation of a tumour in the sub-maxillary space. The tumour is at first hard, but enlarges, becomes soft, and finally bursts, or has to be opened to prevent its bursting on the inside. In some cases the febrile symptoms are so mild as to escape observation; and in such cases the formation of a tumour is the first symptom noticed. There is frequently a discharge from the nostrils. Strangles, like all fevers, runs a certain course, its duration being from eight to ten days, and in twenty days the animal is usually fit to be put to work. The formation of the tumour should be closely watched, and its contents evacuated at the proper time, or it may burst internally and flow into the trachea, and cause death by suffocation.

In some cases the animal becomes emaciated, pulse weak, and signs of abdominal pain are shown, and an abscess of the usual sub-maxillary abscess is observed. These symptoms are indicative of an irregular malignant form of strangles, and the formation of an abscess in some other part of the animal or in the viscera. An abscess may form in any part of the body, no organ or set of organs being secure from invasion.

The treatment of strangles as it ordinarily occurs is by no means a difficult matter. Place the patient in a comfortable, dry, and well-ventilated loose box, pure air in unlimited quantities constituting an important part of the treatment. Nature must be assisted in every way in throwing off the disease. Clothe the animal. The diet should consist of nutritive and easily digestible food; a few doses of nitrate of potash may be given. In a few days tonics may be of great advantage. If the abscess is slow in development, stimulate with heat and moisture: ammoniacal or camphorated liniments, which must be kept warm, or they do no good. Sometimes hot bran in a nosebag, with some turpentine or carbolic acid sprinkled on it, will relieve the animal when there is a discharge from the nostrils. Bran and oatmeal gruel, as soon as the horse will eat it, with other soft, nourishing food, should be given. If constipation is present it may be relieved by an enema of warm water with a little oil in it. In malignant cases it would be advisable to obtain veterinary advice.

SOME REMARKS ABOUT RED RUST.

By A. MOLINEUX.

Rumours are in circulation that red rust is again prevalent in many portions of this State where wheatgrowers are the principal occupiers of the soil. This, if correct—and I have no doubt it is so—emphasises the necessity for cultivating the greater area of our wheatfields with those varieties of wheat which are now well known to be highly resistant to the attacks of red rust. It appears to me that it is not wise to sow rust-labile wheats, when other kinds can be obtained which are at least equal in all respects to the risky sorts. It has been amply proven that several of the rust-resistant varieties of wheat are as hardy, prolific, upstanding, grain-holding, and yet easily thrashed by the stripper, and of as good a milling quality as any of the old, rust-labile sorts, whilst for hay there are equally good kinds. Surely, the farmer who sows rust-labile varieties of wheat runs needless risk.

I have observed for many years that whenever we have a mild autumn and summer, accompanied with occasional showers, we have complaints of red rust in the succeeding crops; and I have been led to the belief that until the new wheat crops have started the rust is nursed by the wild oats and other cereals that may always be found growing on the headlands and by the roadsides. Until the plants begin to produce seeds, the fruits (or spores) of true red rust cannot be produced, but the parasite exists within the body or tissues of the host plant all the same, and most probably produces spores belonging to the intermediary stages of the parasite. This, however, is only theory, but is worthy of enquiry. In this connection the development of red rust may, perhaps, be compared with that of certain insects, the common caterpillars, for instance. As all know, every caterpillar is the larva of a moth. First we have the egg of the moth, then the caterpillar, next the chrysalis, and finally the perfect insect, the moth. So with red rust. We have first the *aecidium* stage; next the *puccinia* form, with its resting spore; and finally the *uredo* stage, red rust, as the farmer knows it on his wheat crop.

What shall be done when a wheat crop has promise of being a heavy one, but shows signs of red rust? Perhaps it will hardly pay to cut it for hay, and rusty hay does not commend itself to careful horse owners. Now, it has been proven several times that the grain of a wheat crop that has been reaped when just past the dough stage is heavier, plumper, and of better colour than grain of the same crop, and of equal promise, that has been left to become fully ripe. But, to harvest wheat at that stage, it is necessary to reap and bind the crop, and afterwards to thrash out the grain. Will it pay to do this? I think it will, because the grain will be of altogether better quality than if left until it is dead ripe and fit for stripping. Then the straw will have been harvested, and will be of use for feeding dry stock, and the field will have been bared, so that the harrows can be run over it; or, better still, the scarifier; and all rain that may fall will soak in, instead of running over the surface to the nearest channel. If anything like a good downpour occurs, there will be some early green feed, and it will also be easy to plough early for fallowing.

But "prevention is better than cure," or even remedial action, and, therefore, it is best to sow the greater portion of the wheatfields with the best of those varieties that are known to be resistant to attacks by red rust.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By ARTHUR J. PERKINS, Principal Agricultural College.

Notes as to progress on the Roseworthy Farm have of late been conspicuous by their absence so far as the pages of this journal are concerned, and I have to regret that even at the present moment pressure of other work does not permit of adequate treatment of this question. I hope, however, later on to be in a position to catch up arrears in this direction.

THE SEASON.

Below will be found recorded the rainfall registered during the winter and autumn months at Roseworthy in 1904, contrasted with the mean figures of the preceding twenty years:—

	1904.	Mean of 20 Years.
	Inches.	Inches.
March	0.39	0.69
April	1.26	1.93
May	1.44	1.74
June	2.43	2.83
July	1.77	1.85
August	1.50	2.10
Total	8.79	11.14

It will be noted that the autumn and winter months of 1904 have been characterised by a slight shortage. The distribution of the rain has, however, been such as to favour the development of the grain crops, which, with a continuance of favourable conditions, should yield exceptionally well. A relative deficiency of rain in autumn and early winter—a trait in the weather which is perhaps normal to local conditions—was very much against the growth of early feed. In fact, until quite latterly the untilled paddocks were bare in the extreme, and during the colder months we were reduced to feeding live stock, including sheep, with hay. Good rains in June and July, and latterly towards the end of August, secure us against any difficulties so far as the ensuing spring is concerned.

So far as my experience of this district is concerned early seasons—and by this I mean wet Marches and Aprils—are favourable to feed, but generally more or less unfavourable to wheat.

THE WHEAT CROPS.

There are about 410 acres under wheat, a large portion of which has never in my experience looked better at a similar time of the year.

The crops in the field known as Nottle's (220 acres) are particularly good. Unfortunately, this large field, which should have been reserved for ordinary farm crops, has been sown to a great variety of wheats, some of which are notoriously unsuited to local conditions: whilst others, owing to their novelty, should on a first trial have been allotted less important areas. It is hardly a wise practice to make a variety test of important areas, to the yield of which the farm has to look for its maintenance.

In this field King's Early and Gluyas are exceptionally fine, and will probably draw the attention of visitors on farmers' day. Warwick and Jerkin are also both looking well.

The wheats in Ebsary's A (40 acres) are less satisfactory. The paddock is somewhat low-lying and wet, and the rains in June and July appear to have caused it to yellow off in patches. To poor tillage must, however, be attributed much of the comparative failure of these plots. The land was fallowed late in October, partly with Bartle's Triumph plough, and the results were far from satisfactory. This implement is hardly suited to the breaking up of lea land. In this paddock again Gluyas and King's Early offer by far the most promising crops. This paddock was top dressed early this month with $\frac{1}{2}$ cwt. of nitrate of soda to the acre.

Paddock No. 5 (150 acres) is sown almost entirely to Bearded Inominate, or, as it is sometimes known, "College Selection." It was seeded last, and, though somewhat backward by comparison with the other fields, carries a very fine even crop.

On the whole, therefore, with a few exceptions, the wheat crops hold out promise of a heavy harvest.

THE BARLEY CROPS.

The barley crops are less satisfactory and even than the wheat crops. They appear to have suffered in the early winter from the effects of frosts, and have not yet recovered completely. These crops were rather dirty, and, as the growth appeared somewhat backward, the drilled crops were hoed with the Garrett horse hoe. This has had the effect of saving the crop in parts, although wet weather hindered its effectiveness over portions of the field.

OAT CROPS.

A far greater area has been allotted to oats than is, in my judgment, warranted by their suitability to the district. In nine seasons out of ten barley will prove the more profitable of the two. The oat crops were very backward for a considerable portion of the winter, and, as is generally the case in such circumstances, suffered considerably from the competition of weeds. This was particularly the case where the oats were somewhat thinly seeded.

OTHER CROPS.

Some rape was sown as a catch crop on stubble land broken up with a Triumph plough some time in February. It failed mostly, and was resown with a mixture of nine-tenths of rape and one-tenth of white mustard on June 9, and has yielded fairly satisfactory, though somewhat late, feed.

Five acres of horse beans and five acres of dun pease were sown on June 9, and are now showing well. They were sown at the rate of two bushels to the acre.

Twenty acres were broadcasted with a mixture of horsetooth maize and pease (two bushels of maize, one bushel of pease to the acre) on July 21. The pease are showing well, but cold weather has retarded the maize. It is proposed to treat this crop partly as green forage and partly as ensilage. Twenty-seven acres of horsetooth and ninety-day maize were drilled in on August 25 and 26. Portion of this crop will either be fed as green forage or ensiled, and portion will be irrigated for a grain crop.

Land is being prepared for sorghums, pie melon, and pumpkin crops.

FALLOWS.

This year's fallows, much to the credit of the Farm Foreman (Mr. E. R. Emery) are more forward than I ever recollect seeing them before. By the middle of August over 600 acres had been broken up, and by the end of the month 70 acres had been cross-ploughed and 60 scarified. It may be assumed that this augurs well for next year's crops.

LIVE STOCK.

SHEEP.—The lambing has been fairly satisfactory, having averaged about 96 per cent. Many of the lambs are, however, very late, whilst some of the earlier ones suffered to a certain extent from insufficiency of green feed through the winter months. On the whole, the lambs lack the evenness of character and quality that have characterised them in past years. The health of the flock has generally been good, though at lambing time the trouble I drew attention to two years ago threatened re-appearance, and six ewes were lost. I have no doubt that it is connected with the nibbling of stinkwort plants in bloom, which apparently has more or less fatal action on ewes approaching their term.

PIGS.—The health of the herd has been good. In common with others we have had to suffer from the effects of low prices that have latterly obtained.

Cows.—The health of the herd has been satisfactory. Supplies of milk and butter are at present in excess of our actual requirements.

EXPERIMENTAL VINEYARD

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

As the dry weather is now approaching, every effort is being made to complete the ploughing as early as possible. The cultivation of the vineyard and orchard is no light task now, for combined the two total practically a hundred acres. This has all to be ploughed twice with three horses, so no time can be lost during the winter months. Fortunately, even in the wettest days, we can work the teams on the sand patches, reserving the heavy lands for more favourable weather and conditions. We endeavour to complete our ploughing by show time if possible, and at any rate to have all the worst done. This year, by visiting day, everything will be looking well, we hope, for the ploughs are rapidly turning the weeds under.

Pruning is completed, and very shortly the vines will be breaking into bud. A few acres of trellis work have been erected, but much more which should be done will have to stand over till next year. Apart from the teams, all spare hands have been employed in digging, hoeing, and other operations.

WANTED, PROFESSOR OF AGRICULTURE.

SOUTH AUSTRALIA.

Duties:—1. To impart theoretical and practical instruction in general agriculture and elementary veterinary science to students at Roseworthy Agricultural College. 2. To visit country districts and deliver lectures to farmers.

Salary at present £350 per annum, with board and residence at College; engagement for three years. Travelling allowances in accordance with Civil Service Regulations.

Candidates must furnish certificates of good health and competency. Applications received at this office until 22nd October.

RICHARD BUTLER,

Treasurer and Minister of Agriculture.

Adelaide, 17th August, 1904.

DEPARTMENTAL NOTES AND WORK.

The past month has seen several important changes in the Department of Agriculture. Consequent upon the resignation of Professor Towar and the recommendation of the Council of Agriculture that the two positions of Principal of the Agricultural College and Professor of Agriculture should not be held by one officer, the Government decided to separate the two appointments, Professor Perkins being offered that of Principal of the Agricultural College. His acceptance of this position necessitated his resignation as Secretary for Agriculture and Editor of *The Journal of Agriculture*. Mr. W. L. Summers, who has been connected with the Department since May, 1892, and has acted as Sub-Editor of *The Journal of Agriculture* from its inception, has been appointed Chief Clerk of the Department and Editor of *The Journal*. These alterations date from August 1, 1904. As will be seen from the notice in this issue, the Government invite applications from persons competent to fill the position of Professor of Agriculture. It is intended that this officer, in addition to undertaking teaching work at Roseworthy College, shall travel about amongst the farmers to a greater extent than it was possible for any one holding the position of Principal of the College.

Mr. P. H. Suter, Dairy Instructor, took up his duties at Roseworthy College on August 1, and is giving a regular course of instruction in dairying to the students. On Wednesday, August 24, Mr. Suter visited Orroroo, and delivered an address on dairying. There is every prospect that a co-operative butter factory will be started at Orroroo.

During August, the Inspectors under the Vine, Fruit, and Vegetable Protection Act in Adelaide passed for export to Victoria and New South Wales 4,206 bushels of fruit, 2,695 packages and crates of vegetables, and 107 parcels of plants. The imports dealt with consisted of 4,335 bushels of fruits, consisting almost wholly of bananas. Of those brought to the Port 328 bushels were refused admission or destroyed on account of the presence and suspected presence of larvæ of fruit fly. Eighty parcels of plants were submitted for admission. Of these 14 parcels were detained owing to the absence of the necessary declaration, and some of them were eventually destroyed. Among the imports were 3,975 fruit trees and 9,000 rooted Northern Spy stocks, on which to graft apples of desired kinds. The enterprise shown by Victorian nurserymen in raising these stocks is resulting in nearly all of our requirements in that line being drawn from the adjoining State.

COUNCIL OF AGRICULTURE.

The first meeting of the newly appointed Council was held on Wednesday, August 10, there being present—Messrs. J. Miller, A. Molineux, G. R. Laffer, A. M. Dawkins, J. Hill, B. Basedow, J. W. Sandford, T. E. Yelland, R. Caldwell, G. F. Cleland, and R. Marshall.

Col. Rowell was unanimously elected Chairman and Mr. Miller Vice-Chairman for ensuing year.

The Hon. Minister intimated that the Government had decided to follow the course recommended at the June meeting of the Council of Agriculture, and to separate the position of Principal of the Agricultural College from that of Professor of Agriculture. The former position had been accepted by Professor Perkins, and the Minister was advertising in Great Britain and Australia for a gentleman competent to fill the office of Professor of Agriculture. When appointed, the latter officer would be able to get about amongst the farmers more than it was possible for any one holding the position of Principal of the College to do. On the motion of Mr. Yelland, it was unanimously resolved that the Council expresses its satisfaction at the course adopted by the Government.

The Hon. Minister intimated that the sieves and other appliances required to put in order the small wheat-testing mill would be obtained, and arrangements made to carry out tests of a sufficient number of samples of wheat to ascertain what the work would cost, after which the question of whether the Department could undertake such tests free would be considered.

The Secretary laid on the table the balance-sheet of the Roseworthy College Farm for year ending March 31, 1904. It was decided to postpone consideration until next meeting.

The Minister advised appointment of Mr. P. H. Suter as Dairy Instructor. Motion moved by Mr. Caldwell—"That in the opinion of the Council no opportunity should be lost of giving dairy farmers the opportunity of profiting from the services of the Dairy Instructor"—was carried. The mover and Mr. Sandford both expressed the opinion that better use of Mr. Thomson's services might have been made had he been able to give more of his time to travelling about amongst the factories and dairy farmers.

Mr. Molineux gave notice of his intention to move at next meeting that the Minister obtain from the Dairy Instructor a report on the question of starting short courses in dairying at Roseworthy and convenient dairy centres for those who were unable to take the full course at Roseworthy.

The Secretary stated that a number of Branches of the Bureau not having reported any meetings for a long time, circulars had been sent to each member, with the result that all but five had re-started. Yankalilla, Swan Reach, Lyrup, Pyap, and Tanunda Branches had been struck off the roll, leaving 111 now in existence. Reports of meetings had been received from all but seven of these during the past three months. Applications for permission to form new Branches at Koppio and Elliston had been received.

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. W. C. Rodgers and M. J. McAuley, Cradock; H. A.

Bauer, Appila-Yarrowie; L. S. Starkey, C. Giles, and A. Penna, Petina; G. Reece and P. Piggott, Clarendon; S. A. Collins, Forest Range; J. Boundy, Minlaton; A. W. Mudge, Port Germein; C. H. Dunn, Hartley; E. Sampson and E. A. Just, Dawson; N. Malcolm, Riverton; T. Wright and J. Hains, Meadows; R. J. Davidson, Wandearah; H. Cannell, Hawker; H. Pfeiffer, A. E. Dickson, and P. B. Wilhelm, Mannum; J. Hehir and P. Tierney, Wepowie; G. Goodes, Gladstone; H. Rollbusch and W. Morcom, Woodside; S. Pounsett, Penola; D. J. Travers, L. Nourse, J. Philp, and G. O. Klabbe, Petersburg; M. Kimber, C. H. Beaumont, and C. Jarman, Clare; A. Lewis, sen., Waikerie; N. Johnson, P. Fisher, and A. Pilmore, Bowhill; C. Ridgway and J. S. Cavanagh, Port Lincoln; A. D. Stock, Port Elliot; W. Hawke, Kingscote; R. Correll and A. E. Joy, Kadina; W. H. Rankine and R. H. Evans, Port Broughton; T. L. Truman, Tatiara; R. J. Holman, Port Pirie; A. S. Swanson, Inkerman; D. Collins, Mount Gambier; F. Bull, Morehard; J. S. Partridge, Woolundunga; J. Harrison, S. R. Logan, M. J. O'Grady, A. E. Ward, and C. O. Meyer, Wilson; H. V. Wright and B. Donovan, Richman's Creek; R. W. Barr, Pine Forest; R. Russell, J. K. McGavisk, and H. R. Antuar, Longwood; A. Seidel and L. Stubling, Morgan.

On the motion of Mr. Laffer, it was resolved that the attention of the Hon. Minister of Agriculture be called to the immense damage done to rural industries by birds and animals introduced from other countries, and that he be asked to introduce legislation with a view to placing the importation of birds and animals under a properly constituted authority. Mr. Laffer said this might appear like locking the stable door after the steed was lost; but, in view of the heavy list of objectionable birds and animals levying toll on the rural producers, it would be well to have legislation which would prevent irresponsible individuals introducing other birds or animals, which, though, perhaps, comparatively harmless in their native country, might prove troublesome under local conditions.

Mr. Yelland referred to suggestion by members of the Poultry Society that, in the event of the Victorian Department failing to modify the present unreasonable regulations dealing with the importation of poultry, the South Australian Government should impose similar restrictions on poultry from Victoria. As their breeders only imported poultry for their own benefit, and not for the benefit of the breeders in the other States any such action as that suggested would only cause greater injury to the interests of poultry breeders here. He moved—"That, instead of giving effect to the proposal of the Poultry Society to impose restrictions on poultry from Victoria, because Victoria had seen fit to take such a course in respect to poultry from South Australia and New South Wales, the Hon. Minister be recommended to communicate with the New South Wales Department with a view to making joint representation to the Victorian Government in favour of modifications of their present regulations." This was seconded by Mr. Sandford and carried unanimously.

On the motion of Mr. Miller, it was resolved that the Hon. Minister's attention be drawn to the fact that Dr. Ramsay Smith had not yet been able to forward his report on the disease causing such heavy losses of cattle, and that, should Dr. Smith's duties not permit of his making a report thereon at an early date, the Government should place the matter in the hands of a qualified authority.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on September 1, 1904:—

August opened with fine growing conditions for feed, but as the rain persistently held off in the Northern districts and continued so, farmers in those parts became very anxious. However, their minds for the present are at rest in this direction, as during the last few days of the month a very useful downpour was recorded. Pastoralists report feed being in good supply and that the lambing generally is the best for several years.

COMMERCE.—With the nearer approach of spring it was fair to expect an improvement in trade, and in this business people were not disappointed, for

buying orders came along freely, so that the month's transactions have been favorable in most lines. At Broken Hill the prospects are now more promising than for some time past, and, as silver keeps firm, also lead, the outlook in the Hill is undoubtedly very assuring.

BREADSTUFFS.—The action of the bulls in America received great support from the weather during August, much damage having been done to the Wheat Crops by storms and rains, not only in the United States, but also in some portions of Europe and Russia. Values of Wheat for United Kingdom consequently advanced considerably, and as much as 34s. 3d. per quarter was paid for forward shipment, whilst cargoes on the passage also fetched increased rates. At the moment of writing, a lull has taken place, and 33s. 9d. is now an outside price, it being reported that buyers have withdrawn from the market, anticipating lower rates. In the Commonwealth, probably the best business for the year has been done, large quantities of Wheat having found a market at top figures. In South Australia 3s. 6d. per bushel was the highest paid, but in New South Wales 3s. 7d. was obtained for some large parcels, millers especially being eager; but, in consequence of the altered state of affairs in the Home Market, buyers are not so keen just at present. Flour.—Good business has been done with London and Liverpool at advanced rates. The price, however, that our millers are now obliged to ask is interfering with trade. Freights also have advanced, which tends to make matters worse. Fodder.—With feed plentiful, there is very little demand for Hay, and chaffcutters feel keenly the absence of export orders, whilst the local trade is also very limited. In millers' offal, Bran and Pollard have met with steady sale, with some little export demand; but, as stocks are not heavy, it is thought that present prices will be maintained. Feeding Grains are almost dormant if it were not for the few odd parcels which have been bought for Broken Hill and Western Australia.

POTATOES.—Since last reporting, there has been quite a flutter in values, "Gambiers" having hardened about 15s. per ton; but, as it is well known that stocks are yet heavy, growers were chary of holding out to the full extent of the advance asked for, more so as the higher quotations attracted several shipments from Tasmania; result, "Gambiers" receded two or three shillings. However, as the quality of the South-East potatoes—Glencoe grown—compare well with the best imported, it is hoped rates now ruling will be sustained. Onions.—Supplies from the Hills district have not been quite sufficient for trade wants, the extras being filled with "Gambiers" and a few odd parcels from Victoria.

DAIRY PRODUCE.—Further evidence of the favourable season is strongly marked by the heavy quantities coming forward, and in Butter it is many years since this State in the month of August had such supplies available for export, and although Broken Hill and Western Australia are buying extensively, shipments each week are also being made to the London market. In fresh in prints the cheapening no doubt very much stimulated the local demand, and this, coupled with packers now operating, kept the market well cleared. Eggs.—With the nearer approach of spring, it was scarcely to be expected that values would hold in face of heavier consignments forwarded each market, so that the seasonable downward trend set in until buying orders from the east and local picklers started operations, which steadied the selling rates. Cheese.—At no time during the month were stocks allowed to accumulate, the consumption readily absorbing all supplies to hand; but, although prices maintained, no advance was obtainable, owing to lower quotations in the East. Bacon.—It was reckoned that the abnormally low rates quoted in our former would not much longer rule, and, as these induced orders for export, curers at last raised their quotations; but warm weather is wanted before any substantial hardening in this line can be established. Hams.—The immediate stocks have been considerably lessened, but it is yet too early for the seasonable enquiry to set in, so that prices are unaltered. Honey had a dull month, but this is not unusual at the end of the season. Almonds.—Several parcels have been disposed of for shipment, but the market is practically unchanged.

CARCASE MEAT.—The weather throughout August was most favourable for forwarding Pork and Veal, and, as at the Friday's sales the trade operate for their Saturday wants, speedy clearances were effected, competition, as usual, being keenest for bright, handy, well-slaughtered carcasses of pork

weighing from 60 to 90 lb. Other classes also sold well, according to condition and quality. Veal.—Prime dairy fed and nicely slaughtered vealers realised satisfactory rates, but farmers would do well to see that the calves are in good condition before killing for market. Dressed Poultry sold readily.

In Live Poultry the penning was fairly heavy, and as the standard of quality was maintained good prices were secured.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, $3/4$ to $3/5$ per bushel of 60 lb.

FLOUR.—City brands, £8/10/-; country, £7 to £7/5/- per ton of 2,000 lb.

BRAN, $7\frac{1}{2}$ d. to $7\frac{3}{4}$ d.; POLLARD, $7\frac{1}{2}$ d. to $7\frac{3}{4}$ d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, $1/4$ to $1/6$; White Champions, $1/10$ to $2/-$ per bushel of 40 lb.

BARLEY.—Cape, $1/10$ per bushel of 50 lb.

CHAFF.—£2/10/- (nominal) per ton of 2,240 lb., f.o.b. Port Adelaide.

POTATOES.—Gambiers, £2/16/- per ton of 2,240 lb., f.o.b. Port Adelaide.

ONIONS.—Locals and Gambiers, £3/15/- to £4 per ton of 2,240 lb.

BUTTER.—Factory and creamery fresh in prints, $7\frac{3}{4}$ d. to 9d.; best separators and choice dairies, 6d. to $7\frac{3}{4}$ d.; fair dairies and ordinary separators, 6d. to $6\frac{1}{2}$ d.; store and collectors' lots, 5d. to 6d. per lb.

CHEESE.—Factory makes, $5\frac{1}{2}$ d. to $6\frac{1}{2}$ d. per lb.; aged and dry lots, $4\frac{1}{2}$ d. to 5d.

BACON.—Factory cured sides, 6d. to $6\frac{1}{2}$ d.; farm flitches, $5\frac{1}{2}$ d. to 6d. per lb.

HAMS.—S.A. factory, 7d. to 8d. per lb.

EGGS.—Loose, $6\frac{1}{2}$ d.; in casks, f.o.b., 8d. per dozen.

LARD.—In bladders, $4\frac{1}{2}$ d.; tins, 4d. per lb.

HONEY.— $2\frac{3}{4}$ d. for prime clear extracted in 60-lb. tins; discoloured and candied, $1\frac{1}{2}$ d.; beeswax, $1/1$ per lb.

ALMONDS.—Soft-shells, 4d. to $4\frac{1}{2}$ d.; kernels, $8\frac{1}{2}$ d. per lb.

CARCASE MEAT.—Bright, handy-weight shop porkers, $4\frac{1}{2}$ d. to 5d. per lb.; medium to good baconers, $3\frac{1}{2}$ d. to 4d.; choppers and rough sorts, $2\frac{1}{2}$ d. to 3d.; prime dairy fed veal, 3d. to 4d.; poor to medium, $1\frac{1}{2}$ d. to $2\frac{1}{2}$ d.

DRESSED POULTRY.—Turkeys and fowls realised 5d. to $6\frac{1}{2}$ d. per lb.

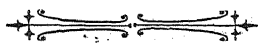
LIVE POULTRY.—Prime table roosters fetched $1/9$ to $2/2$ each; good hens and fair-conditioned cockerels, $1/3$ to $1/8$; poor and light, 10d. to $1/$; ducks, $1/6$ to $2/$; geese, $2/6$ to $3/6$; pigeons, 8d.; turkeys, 5d. to 6d. per lb. live weight for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

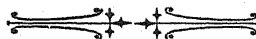
BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
	Sept. 22	Oct. —		Sept. 17	Oct. 15
Amyton ..	22	—	Minlaton ..	24	—
Arthurton ..	17	8	Morchard ..	24	—
Balaklava ..	20	18	Morgan ..	20	—
Booloroo Centre ..	23	1	Morphett Vale ..	24	22
Bowhill ..	2	7	Mount Bryan East ..	17	—
Brinkworth ..	16	21	Mount Gambier ..	22	20
Burra ..	20	18	Mount Remarkable ..	23	21
Carrieton ..	13	11	Mundoorra ..	21	19
Cherry Gardens ..	23	21	Nantawarra ..	10	8
Clare ..	3	1	Naracoorte ..	17	—
Colton ..	20	18	Narridy ..	23	21
Elbow Hill ..	17	—	Norton's Summit ..	22	20
Crystal Brook ..	24	22	Onetree Hill ..	23	28
Dawson ..	26	24	Orroroo ..	—	8
Eudunda ..	5	3	Penola ..	17	13
Finniss ..	22	20	Petina ..	20	18
Forest Range ..	10	8	Pine Forest ..	24	22
Forster ..	23	21	Port Broughton ..	17	15
Gawler River ..	3	1	Port Elliot ..	17	22
Gladstone ..	22	20	Port Lincoln ..	23	21
Golden Grove ..	24	—	Reeves Plains ..	23	—
Hahndorf ..	23	21	Rhine Villa ..	26	24
Hartley ..	20	—	Richman's Creek ..	24	22
Inkerman ..	24	—	Riverton ..	16	21
Johnsburg ..	23	21	Saddleworth ..	3	—
Kanmantoo ..	3	1	Stansbury ..	26	24
Kapunda ..	12	10	Stockport ..	26	24
Kingscote ..	3	29	Strathalbyn ..	24	22
Kingston ..	22	20	Utera Plains ..	20	24
Koolunga ..	—	1 & 29	Virginia ..	19	24
Longwood ..	22	—	Wandearah ..	19	17
Lyndoch ..	3	1	Watervale ..	20	18
Maitland ..	5	3	Wepowie ..	17	15
Mallala ..	17	15	Whyte-Yarcowie ..	3	1
Mannum ..	26	—	Willunga ..	21	19
Meadows ..	10	8	Wilmington ..	10	8
Meningie ..			Woolundunga ..		



MONTHLY RAINFALL.

The following table shows the rainfall for the month of August, 1904:—

Adelaide ...	1 98	Manoora ...	1 07	Echunga ...	3 48
Hawker ...	0 64	Hoyleton ...	0 90	Macclesfield ...	3 11
Cradock ...	0 25	Balaklava ...	1 05	Meadows ...	3 62
Wilson ...	0 52	Port Wakefield ...	0 97	Strathalbyn ...	1 56
Gordon ...	0 28	Saddleworth ...	1 30	Callington ...	1 46
Quorn ...	0 76	Marrabel ...	1 46	Langhorne's Bridge ...	1 26
Port Augusta ...	0 35	Riverton ...	1 90	Milang ...	1 26
Port Germein ...	0 79	Tarlee ...	1 22	Wallaroo ...	1 30
Port Pirie ...	1 22	Stockport ...	1 17	Kadina ...	1 54
Crystal Brook ...	1 72	Hamley Bridge ...	1 28	Moonta ...	2 08
Port Broughton ...	1 05	Kapunda ...	1 67	Green's Plains ...	1 25
Bute ...	1 57	Freeling ...	1 44	Maitland ...	2 32
Hammond ...	0 27	Stookwell ...	2 34	Ardrossan ...	1 12
Bruce ...	0 24	Nuriootpa ...	2 06	Port Victoria ...	1 31
Wilmington ...	1 04	Angaston ...	2 47	Curramulka ...	2 76
Melrose ...	1 89	Tanunda ...	2 43	Minlaton ...	1 90
Booleroo Centre ...	1 36	Yundah ...	2 63	Stansbury ...	1 89
Wirrabara ...	2 59	Mallala ...	1 43	Warooka ...	1 99
Appila ...	1 90	Roseworthy ...	1 73	Yorketown ...	2 21
Laura ...	2 15	Gawler ...	2 23	Edithburg ...	1 40
Caltowie ...	1 66	Smithfield ...	1 80	Fowler's Bay ...	0 79
Jamestown ...	1 59	Two Wells ...	1 65	Streaky Bay ...	0 87
Gladstone ...	2 18	Virginia ...	2 35	Port Elliot ...	1 56
Georgetown ...	1 75	Salisbury ...	2 50	Port Lincoln ...	3 03
Narridy ...	1 49	Tea Tree Gully ...	3 87	Cowell ...	0 52
Redhill ...	1 50	Magill ...	2 54	Queenscliffe ...	1 59
Koolunga ...	1 34	Mitcham ...	2 66	Port Elliot ...	1 72
Carrieton ...	0 48	Crafers ...	5 51	Goolwa ...	1 76
Eurelia ...	0 79	Clarendon ...	3 62	Meningie ...	2 18
Johnsburg ...	0 55	Morphett Vale ...	2 54	Kingston ...	2 24
Orroroo ...	1 05	Noarlunga ...	2 42	Robe ...	1 62
Black Rock ...	0 92	Willunga ...	3 77	Beachport ...	2 71
Petersburg ...	0 93	Aldinga ...	2 86	Coonalpyn ...	1 80
Yongala ...	1 16	Normanville ...	1 98	Bordertown ...	1 89
Terowie ...	1 01	Yankalilla ...	2 16	Frances ...	1 85
Yarcowie ...	1 13	Eudunda ...	1 37	Naracoorte ...	—
Hallett ...	1 33	Truro ...	2 08	Lucindale ...	2 94
Mt. Bryan ...	1 67	Palmer ...	0 99	Penola ...	2 32
Burra ...	1 16	Mount Pleasant ...	1 96	Millicent ...	2 46
Snowtown ...	1 56	Blumberg ...	2 95	Mount Gambier ...	2 30
Brinkworth ...	1 24	Gumeracha ...	4 29	Wellington ...	1 19
Blyth ...	0 93	Lobethal ...	4 66	Murray Bridge ...	1 45
Clare ...	1 78	Woodside ...	2 65	Mannum ...	0 63
Mintaro Central ...	1 53	Hahndorf ...	3 90	Morgan ...	0 32
Watervale ...	2 08	Nairne ...	2 82	Overland Corner ...	0 35
Auburn ...	1 65	Mount Barker ...	2 95	Renmark ...	0 52



AGRICULTURAL BUREAU REPORTS.

Kapunda, July 2.

PRESENT—Messrs. Shannon (chair), Byrne, Teagle, Vogt, Holthouse, Pascoe, O'Sullivan, Kerin, and Harris (Hon. Sec.), and one honorary member.

STANDARD BUSHEL.—Various replies from Branches *re* proposed petition to Parliament were read. The Hon. Secretary reported that nine petitions, carrying 129 signatures, had been returned to him.

WEEDS.—Mr. O'Sullivan read a paper on this subject. His object was to call attention to the many weeds that cumber the land, and to impress on members the fact that they could not grow full crops so long as they allowed the weeds to grow amongst the wheat. He did not think any of them knew what a full crop on clean land was. They might have what they termed a clean crop, but if they would examine carefully and note the number of foreign plants on one square yard of land occupied by the wheat, they would probably be surprised at their number. There was no question that every one of these weeds was taking the room, moisture, and nutriment that should be available to the crop. At one time he thought the more land he could get into crop the better off he would be at harvest, but experience had convinced him of his error. A far smaller area of properly tilled land was more profitable. It was a very difficult matter to clean the land properly, as so much depended upon the weather; but, with the improved implements at their command, they could do a lot in this direction. There were, however, worse places than even a cultivated crop for weeds to grow in. Their grazing lands were becoming overrun with weeds, and if the thistles that have spread so much of late were not checked they would find the value of the land much depreciated. In the past, if the land was well fenced, stock could be turned into the paddocks, and very little extra expense was necessary. He knew places where there were hardly any thistles ten years ago, which were now practically useless for grazing. Things were bad enough now, but if attention was not given to the destruction of these thistles they would be a source of great expense in the future. The thistles were worst on the best of their land, the flats along the watercourses being in many instances merely beds of thistles. This land produces more and richer feed under proper conditions than double the acreage of higher ground. Individual effort to deal with them was practically useless, as the seeds were carried by floods and by the wind in all directions. He was under the impression that the District Councils had power to compel land-owners to destroy these weeds, but, from the little that was done, it was evident that they used their power in this direction very sparingly. He thought the various Branches of the Bureau should unite in bringing before the public the necessity for vigorous action in this matter. He thought one cause of the trouble was that in too many cases the farms were too large for the owner to give them the attention they required. Another difficulty was the presence of weeds on roads and reserves, as if these are not dealt with the adjoining land is being continually re-seeded.

Morgan, July 23.

PRESENT—Messrs. Windebank (chair), Bruhn, Hahn, Pope, Lindner, Hausler, Hewitt, Haupt, R. and H. Wohling (Hon. Sec.), and one visitor.

DAMSINKING.—Mr. W. Lindner read a paper on this subject. He thought the farmers in dry districts should give more attention to the making of dams in suitable positions, especially during a season like the present, when feed for stock was plentiful. If farmers would sink one large dam instead of two or three small ones, there would be a deal less time wasted in carting water. The dam should be large enough to hold at least twelve months' supply. He preferred the buck scraper to the scoop for excavating, as it was easier on both men and horses and was cheaper and quicker in its work. A buck scraper 6 ft. wide will cost about £3, as against £6 for an ordinary scoop, and £13 for a patent half-yard scoop.

STANDARD BUSHEL.—Members generally favoured Kapunda proposal for a fixed standard of 60 lb. per bushel.

Craddock, July 23.

PRESENT—Messrs. Paterson (chair), McAuley, Solly, Ruddock, Rodgers, Gillick, and Lindo (Hon. Sec.), and two visitors.

SKINLESS BARLEY.—The Chairman tabled sample of this barley, grown in his garden. He had grown three crops in one year. In June, 1903, he sowed the grain from one head, and reaped it in December; seed was at once sown again, and this crop reaped in March, 1904. The plants made fresh growth from the stumps, and he gathered ripe grain again in June. He found his stock very fond of both straw and corn.

UNLOADING RAILWAY TRUCKS.—Mr. Solly read letter from Railways Commissioner stating that six hours was allowed to consignees to unload a full truck at railway stations. Members considered this altogether too short a time, and it was resolved that, except during the busy season of January and February, the time allowed for unloading should be extended.

Finniss, August 1.

PRESENT—Messrs. Collett (chair), Chibnall, and Henley (Hon. Sec.).

FEEDING CALVES.—Mr. J. Chibnall read a paper on this subject. He made it a practice to tie up calves when feeding them, as it saved many a knock, and was also good training for their future as dairy cows. Separator milk should be fed to calves warm. Cold milk had a tendency to cause scouring. Unless there was a heating apparatus to the separator the milk was scarcely warm enough as it came from the machine. Something to replace the butter fat that is removed from the milk was needed, and he thought that if they could get crude cod liver oil it would be very useful. A little salt and a little brown sugar might be added to the milk now and then. A calf should suck and not drink if it is to thrive properly. For several years he had used the indiarubber teat for feeding purposes, making the hole fairly large. He found metal tubes unsatisfactory. An experiment he allowed one calf he was rearing to drink the milk, with the result that it was "pot bellied." Two others reared at the same time and made to suck were quite different. A calf that sucks never over-feeds, and is satisfied with less milk than one that drinks. He thought that allowing calves to drink resulted in bad digestion, and laid the foundation for "dry bibles." At any rate, he never knew of a cow that had been reared by its mother suffering from that complaint. He would not allow the calf green feed until at least two months old. He found good clean hay, in conjunction with milk, satisfactory.

Renmark, July 28.

PRESENT—Messrs. Johns (chair), Geneste, Cole, Kelly, Ogilvy, and Evans (Hon. Sec.).

HUMUS.—Mr. Johns read a short paper on orchard fertilisation, in which he particularly referred to the value of humus, and to the necessity for providing it by artificial means. Clean cultivation in winter, with irrigation and constant cultivation in summer soon reduced to a minimum the natural supply of humus. Their soil in places gave evidence of this by becoming compact and lifeless and unable to retain moisture. Farmers in most parts of the world have found the best results over a series of years to be obtained by a system of rotation of crops, and in this rotation the leguminous crop always plays an important part in the success of the following crop. They could not practise rotation of crops in their orchards, but they could grow green crops to plough under to supply humus to the soil, and if a leguminous crop is selected it will add nitrogen to the soil. In California, under irrigation conditions similar to their own, a species of *Trigonella*, known as "fenugreek," was highly spoken of as a green manure crop, and he thought it would be well worthy of a trial at Renmark. Considerable discussion ensued, and it was decided to endeavour to obtain information concerning fenugreek. [This plant has been well known for many years as a medicinal and culinary herb, but so far as I can learn has never been grown in South Australia except experimentally. Seed can be obtained from local seedsmen.—Ed.]

Inkerman, July 26.

PRESENT—Messrs. Kennedy (chair), Board, Fraser, Mugford, Williams, Daniel, and Smart, and two visitors.

STANDARD BUSHEL.—Circular from Kapunda Branch was discussed. None of the members favoured the proposal for legislative action to make a fixed standard of 60 lb. per bushel. Several members favoured a 62½ lb. standard, and two would have it 63 lb., but the necessity for varying the standard according to the season was recognised, and a resolution that it was not desirable to have a fixed standard was carried. Members condemned the small measures used by buyers, and stated that it was rare for two to give the same weight for one sample of grain. Members also favoured fixing the standard as early as possible in the season.

BAGS AS WHEAT.—Members thought the system of selling wheatbags in the proper one, as, whatever commodity they purchased in bags, the bags were weighed in. Though it seemed that they were losers when wheat was under 3s. 6d. per bushel, the system was the most convenient to all concerned.

Pine Forest, July 26.

PRESENT—Messrs. Bayne (chair), Johns, Inkster, Phillis, Masters, Kempster, and Barr (Hon. Sec.).

STANDARD BUSHEL.—Resolution from Crystal Brook Branch, in favour of a fixed legal standard of 62 lb. to the bushel, was discussed at length. It was decided to support the proposal for legislative action in this matter, and regret was expressed that the position taken up by the Corn Trade Section of the Chamber of Commerce rendered it necessary to appeal to Parliament.

ROOFING HAYSTACKS.—The Chairman asked whether in roofing haystacks the butts or heads of the sheaves should be outwards. Mr. Johns considered it immaterial, so long as the middle of the stack was kept sufficiently high to give a good slope outwards. When stacks were likely to remain for any length of time he would advise thatching, and if straw was not available he would use hay for the purpose. Mr. Barr thought it unnecessary to thatch the stacks in this district, where, as a rule, only sufficient hay for the farm stock was cut. If the stack was properly constructed the loss from wet would be almost nil. He had roofed stacks with the butts out, and kept the centre so full that the sheaves had to be placed at the right slope to prevent them from falling off. It was impossible for the rain to penetrate to any extent if the sheaves were maintained in this position.

PLOUGHING WITH SIX-FURROW PLOUGHS.—Discussion on how many horses of a team of eight, drawing a six-furrow plough, should be allowed to walk on the ploughed ground, took place. Members thought everything depended upon the construction of the plough. It was best both for the horses and for the land that as few as possible of the team should walk on the ploughed ground, but some ploughs were so built that, although provided with adjustable pulling gear, they did not follow well unless the pull was exactly from the centre. Consequently the ploughman had no choice but to work three out of the eight horses on the ploughed land.

SEASON.—The opinion was generally expressed that so far the season in this district was more promising than had been the case for quite fifteen years.

Eudunda, July 25.

PRESENT—Messrs. Gosling (chair), Von Bertouch, Seiber, Walter, Pfitzner, Shiller, Weil, Kluske, and Marshall (Hon. Sec.).

PASPALUM DILATATUM.—Mr. E. S. Smith, of Tablelands, reported that this grass was doing well with him, and he would be able to supply a few plants to members for trial.

EDUCATION FOR FARMERS.—The Hon. Secretary explained at length his views on this subject.

Longwood, June 25.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Vogel, and Hughes (Hon. Sec.), and six visitors.

ANNUAL REPORT.—The Hon. Secretary's report showed one special and twelve ordinary meetings held, with an average attendance of nine members and nine visitors. At the special meeting nine members and 110 visitors were present. Generally members have shown more interest in the work of the Branch, numerous exhibits of produce have been tabled at different meetings, and three papers have been read. The first show of produce proved a great success.

EGG-LAYING RECORD.—The Hon. Secretary reported having a hen that laid 22 eggs in as many successive days. She then went broody, and was set on 12 of her own eggs. Another hen was set on the balance, 18 chicks being the result.

Woodside, July 25.

PRESENT—Messrs. Caldwell (chair), Rollbusch, Kleinschmidt, Murphy, Johnston, Lauterbach, Drogemuller, and Hughes (Hon. Sec.).

CONFERENCE OF HILLS BRANCHES.—It was decided that the Annual Conference of Hills Branches be held at Woodside on October 21, 1904.

IMPROVEMENT OF WHEAT.—Members expressed pleasure at Mr. Marshall's resolution, asking the Department of Agriculture to take action in reference to the improvement of the milling quality of South Australian wheats. Mr. R. Caldwell read a paper on some of the advantages of scientific knowledge in agriculture.

Wepowie, July 26.

PRESENT—Messrs. Gray (chair), Fisher, Chrystall, Smith, Hanna, Orrock, Bishop, Gale, and Halliday (Hon. Sec.), and ten visitors.

CO-OPERATION.—Mr. P. McNamara read a paper on the advantages of co-operation amongst farmers. He traced the formation of the South Australian Farmers' Co-operative Union, which had been of great benefit to the farmers of the State. Farmers could dispose of their grain, wool, and skins through the Union, and he thought it would be a very good thing if the Directors could see their way to extend operations to all dairy produce, as the farmer was too much in the power of the middleman in selling this line of produce. He believed the Union could easily deal with butter, cheese, carcase meat, and eggs, by holding auction sales twice a week, and the charges need not be anything like so high as those made by private firms. Considering the amount of dairy produce that is sold in South Australia, he considered they should have a better way of disposing of it, and he could see no way more likely to give satisfaction to the producer than the one suggested.

Utera Plains, July 23

PRESENT—Messrs. R. Deer (chair), J. Deer, sen., J. Deer, jun., Guider, Venning, J. Deer, A. R. S. and A. R. Ramsey (Hon. Sec.), and two visitors.

DESTRUCTION OF RABBITS.—Mr. J. Deer read a paper on this subject. He had tried various methods of clearing the land of rabbits, and was of opinion that systematic poisoning during the summer months was most effective. He also advised keeping a few ferrets to hunt the rabbits out of the burrows. Dogs were also required to hunt the rabbits as they try to escape; tailing dogs, a few nets would be found useful. All the burrows should be securely filled in when cleared of rabbits. Members generally thought poisoning the best method.

SPARROWS.—Discussion on damage done by sparrows took place. These birds are becoming very plentiful, and it was decided to approach the District Council with a view to action being taken to destroy them.

Morchard, July 29.

PRESENT—Messrs. Scriven (chair), Toop, Kitto, O'Loughlin, Kupke, Forbes, Longbotham, Kirkland, McDougall, and Beck (Hon. Sec.), and thirteen visitors.

HOMESTEAD MEETING.—Members and friends met at the Chairman's residence, and devoted the afternoon to the inspection of the various parts of the farm. The orchard was looking very well, the trees being vigorous and healthy. The cleanliness and suitability of the pigsties were favourably commented on. Mr. Scriven showed members a stack of sorghum hay, and stated that, mixed with chaff, stock relished it very much.

HORSE COMPLAINT.—Members stated that a number of horses had died suddenly on different farms in the district. They were of opinion that death was due to poison weeds. Several cows were reported to have died from impaction, and the hope was expressed that a preventive or cure for this complaint would be found early, as losses experienced throughout the State were of a serious character.

BEAUTIES OF NATURE.—Mr. Longbotham read a paper on this subject, in which he advocated co-operation on the part of farmers to conserve and utilise for irrigation purposes the water from the many creeks in the district. Members thought it would be difficult for farmers to construct cheaply banks strong enough to withstand the rush of water, besides which, owing to the hilly nature of the country areas of land suitable for irrigation were not readily found.

Davenport, July 14.

PRESENT—Messrs. Trembath (chair), Hodshon, Roberts, Hewitson, Holdsworth, and Lecky (Hon. Sec.).

POULTRY FARMING.—Mr. Trembath reviewed paper read at previous meeting by Mr. F. B. Rathbone. He considered the outlay indicated far too elaborate and expensive. The netting yards need not cost more than £66, houses £80, and in various directions Mr. Rathbone's capital account could be reduced by £100. The estimate of egg production was not high enough. Under a proper system of management, a man devoting all his time to poultry should be able to improve his birds until they averaged 150 eggs per hen. This would mean £55 per annum more on the gross returns from 800 birds. Altogether he contended that the annual expenditure could be reduced to £244, while the income would be increased to £440. At the same time, however, he thought very few could go into poultry farming on such a scale, and the main value must be in poultry as an adjunct to the farm, dairy, or orchard.

FERTILE EGGS AND HOW TO GET THEM.—Mr. Trembath read a lengthy extract on this subject, which was summed up as follows:—Feed well a balanced ration, but make the fowls exercise; furnish green food every day; safeguard against sexual exhaustion; breed only from birds of unquestioned vitality and stamina; alternate the males, feeding them all they will eat; use cockerels during late winter and spring. Keep them free from vermin, and don't crowd in pen or runs. Steer clear of inbreeding, and you can have the same experience as the writer has had, namely, 94 to 95 per cent. of fertile eggs, which has never been varied from but twice—once where hens four or five years old were used, and once where the eggs came from hens where incestuous relationship had been practised.

Wilmington, July 27.

PRESENT—Messrs. Robertson (chair), Sullivan, Bischof, A. and M. Maslin, Schuppan, Slee, Broadbent, Noll, Zimmermann, McLeod, Bauer, and Payne (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members did not approve of Kapunda proposal for a fixed standard of 60 lb. per bushel, but, by a large majority, supported suggestion of Crystal Brook Branch that Parliament should be asked to fix the standard permanently at 62 lb.

PREPARING THE LAND FOR SEEDING.—The Chairman read paper prepared by Mr. H. Farrell. In dealing with this subject, every farmer must, of course,

be largely guided by local, climatic, and soil conditions. As much as possible of the area sown should be fallowed, and ploughing should be commenced as early as possible after the winter sets in; say in July. Care must be taken not to plough when the soil is too wet, as great difficulty will be experienced in pulverising the soil properly. The weeds should be allowed to get a fair start, and then be ploughed in. He would plough about 5 in. deep. If the land is fallowed late in the season it usually remains rough and lumpy, and a fine seedbed is difficult to secure. He would harrow directly after ploughing, as working the surface down gave the weeds every chance to germinate. The scarifier should be used to destroy the weeds. Through the summer all available spare time should be devoted to cultivating and cleaning the land, in order to get a good seedbed. This working should be shallow, but care must be taken that the soil does not become caked, or most of the advantages of fallowing will be lost. To a farmer cultivating large areas he would advise drilling in the super before seeding operations are started, and broadcast seed later on. Drilling in the seed was a comparatively slow operation, but it had this advantage that it economised seed and ensured that all the seed was covered and put in at a uniform depth, the result being seen in more even germination. It was a great mistake to be in too great a hurry to get the seed sown. He would on no account start until the weeds had sprouted, as then the latter would be destroyed by seeding operations. He did not believe it paid to stint the seed. One bushel per acre of wheat and $1\frac{1}{2}$ bushels of oats were not too much. With a light rainfall the dressing of manure must be light. Here he thought 50 lb. to 80 lb. per acre quite sufficient for grain, but for hay a heavier dressing may be applied, though rankness of growth due to heavy manuring must be avoided. A long discussion ensued, most members agreeing in the main with the writer so far as districts with a fair rainfall were concerned; but in the dry areas it would not be practicable to adhere to the lines laid down.

JOURNAL OF AGRICULTURE.—On the suggestion of Mr. Broadbent, it was decided that at each meeting one or more members should be appointed to read the current issue of *The Journal of Agriculture*, and bring forward at next meeting short notes on the most salient points of each issue.

Stansbury, July 2.

PRESENT—Messrs. Humphrey (chair), Anderson, Faulkner, and Cornish (Hon. Sec.).

CHAIRMAN.—Mr. J. Sherriff tendered his resignation as Chairman, Mr. H. Humphrey being appointed to the vacant position.

PRUNING CONTEST.—On July 12 Mr. George Quinn gave an address on the proposed Vegetation Diseases Bill, the provisions of which are opposed by the members. On July 13 a pruning match took place, there being thirteen competitors. After the contest, Mr. Quinn gave a demonstration in pruning the different varieties of fruit trees.

Clare, July 22.

PRESENT—Messrs. Birks (chair), Kelly, Knapstein, Carter, Hague, Martin, Dolan, Dall, McCarthy, and Greenway (Hon. Sec.).

SUMMER CROPS.—Mr. Carter initiated a discussion on preparation of the land for summer crops. The relative merits of lucerne, sorghum, kale, rape, etc., were discussed at length.

ANNUAL REPORT.—The Hon. Secretary's report showed that twelve ordinary and four special meetings had been held during the year. The average attendance at the ordinary meetings had been eight, and visitors were few and far between. He considered this out of all proportion to the labour and trouble expended by members in preparing papers to read at meetings of the Branch. The attendance at the special meetings had been very satisfactory. The Chairman and Hon. Secretary were thanked for their services, and re-elected. It was decided that the subject for discussion at next meeting be the question of extending the usefulness of the Branch.

Port Pirie, July 23.

PRESENT—Messrs. Wright (chair), Hector, Johns, Humphris, and Wilson (Hon. Sec.).

STANDARD BUSHEL.—Members were of opinion that it was impracticable to legislate on this matter, and they would prefer to return to the old system of buying and selling by sample.

TREATMENT OF HORSES' COLLARS.—This subject was discussed. Members were of opinion that on removing the collars from the team at midday the first collar taken off should be placed on the ground with the lining upwards, and the others stacked on it lining down. When harnessing up, the collars should first be rubbed with a piece of wood or other material to remove the dry sweat, hairs, and any lumps. This treatment would also be found a help in keeping the collars soft. Mr. Hector spoke favourably of trap-horse collars stuffed with chaff and lined with basil. A hard collar was considered to be better than a soft one, provided it was made to fit the horse's shoulders. In the case of sore shoulders the collar should be made for the horse, and attention given to the harness to alter the point of draught. False collars and leather-lined collars should be kept well greased. One member, however, stated that he had a horse's shoulders scald through the use of grease on a false collar.

STRANGLES.—Members recommended treating affected horses as follows:—Put a hot bran mash in a nosebag, add a little eucalyptus oil, and put it on as hot as possible to steam the nostrils thoroughly.

PICKLING WHEAT.—Paper read at Orroroo Branch by Mr. Tapscott (page 701, *Journal of Agriculture* for July, 1904), was discussed, but members did not consider Mr. Tapscott's experiments proved anything one way or the other.

Watervale, July 25.

PRESENT—Messrs. Sobels (chair), Ward, Perrin, Ashton, Williams, Treloar, Scovell, and Castine (Hon. Sec.).

HOUSING OF CATTLE.—Mr. Williams read an extract dealing with the housing of cattle in winter. A long discussion took place. Members consider that a great mistake has been made in most parts by removing all the natural shelter from the paddocks. If this had been left, there would have been little necessity for either rugging or housing cattle under ordinary conditions. One member thought a paddock of good feed better than any rug. The Hon. Secretary referred to the way some cows were rugged. An ordinary wheatsack was cut open and fastened over the cow. This soon got soaked with rain, and when the sun came out the animal was subjected to a process of steaming, causing more harm than good.

FEEDING AND HOUSING OF HORSES.—Mr. O. H. Castine read a short paper on this subject. He thought the user of the horse should have to feed and look after every horse he has to work, as if a man does not take an interest in the welfare of the animals he is working he is not to be trusted with them. He believed in short, hard feed, such as chaff and oats, or bran, the former for preference, as most of the bran they got nowadays contained very little nourishment. He would feed chaff and oats three times a day, and give long, loose, oaten hay at night. Care should be taken to feed regularly. He would not allow the team to go to water directly the harness was taken off. He thought it better to let them have a little food first. Horses used to drinking when over-heated do not suffer any ill-effects, but before they reach that stage there was likely to be losses. He would on no account let the horse have a long drink of cold water before starting on a journey, as it was likely to affect his wind and also to cause scouring. Grooming was an important subject; in fact, it was as necessary as a good wash to human beings. Housing was one of the most important items connected with the management of horses. With a horse poorly housed, or not housed at all, half the food is really wasted. In this matter they could learn a lesson from the average German farmer, who gave the horse his first consideration, taking care that he erected a good warm stable for his workers and provided plenty of bedding and a stall for each animal.

Kanmantoo, July 22.

PRESENT—Messrs. Lehmann (chair), Lewis, Mills, Formby, E. R. and J. Downing (Hon. Sec.).

FERTILISERS. Mr. F. Formby read a paper on "Fertilisers, and How to Value Them." Mr. Formby based his remarks on the standards of value for the different constituents of fertilisers adopted in other countries. Under the Fertilisers Act vendors were required to furnish every purchaser with a statement in the invoice showing the percentages of nitrogen, potash, and phosphoric acid in its various forms, and this should be insisted on by the purchaser. To indicate other constituents than the above was of little or no value, and the practice might fairly be regarded as so much padding, likely to confuse the purchaser. Generally, the more concentrated the fertiliser the more valuable it was to the user, as there was so much less waste material to be handled. In respect to the effect of fertilisers on fruit crops, experiments made a few years ago in the State of Missouri brought to light the fact that twigs, fruit spurs set with apples, showed that the larger amount of lime, phosphoric acid, and potash in the bearing twigs is very marked, as compared with the non-bearing twigs. It would thus seem that the effect of fertilising fruit trees cannot possibly manifest itself in the same year in an increased fruit crop, but appears to a certainty the year after. So that fruit-growers valuing fertilisers must bear this in mind to arrive at a correct conclusion of the action of manures on their fruit crop. Speaking in a general sense, nitrogen applied as a fertiliser produces wood and leaves, phosphates produce fruit, and potash produces sweetness and flavour, gypsum and sulphate of iron help to fix the fruit on the tree. An abundance of nitrogen is indicated by rank growth and dark green foliage and by size and coarseness of fruit. Conversely, stunted growth and pale leaves often show lack of nitrogen: fewer fruit formed; these are of smaller size, and colour early. On oranges excessive organic nitrogen results in thick rind, abundant rag, and sometimes in causing defoliation, die back, and gumming diseases. Lime and potash will correct the effect of heavy doses of organic nitrogen. Mineral nitrogen stimulates the production of fruit more than excessive applications of organic nitrogen. In oranges, thinner skin and little rag, or fruit pith, is produced. Sulphate of ammonia, when there is a slight deficiency of potash, tends to sweeten the fruit. Phosphoric acid starvation is at times manifested by the variegation in the foliage. The application of phosphates throws the tree into fruit quicker, and has a most beneficial influence on the growth of the plant. Potash fertilisers were not sufficiently used by fruitgrowers, considering the amount of this element found in the ashes of fruit. Heavy doses of potash, unless correspondingly accompanied by other fertilisers, produce sour fruit. On the other hand, lack of potash is shown by spindly growth of wood, which summers badly and is easily injured by frost. Good results can be obtained by applying it in the early spring to aid the plant in withstanding the spring drought, which often causes a great deal of the fruit to drop off. Lime is notable in its effect on table grapes. It also tends to hasten the ripening and perfect the colouring of oranges. Deficiency of lime, on the other hand, is often accompanied by thick skin and poor aroma.

Onetree Hill, July 21.

PRESENT—Messrs. J. Bowman (chair), Barritt, Blackham, Blake, F. and G. Bowman, Cowan, Flower, Hogarth, Ifould, Kelly, Smith, Thomas, and Clucas (Hon. Sec.), and six visitors.

PICKLED WHEAT FOR TURKEYS.—Mr. Ifould asked whether any member had noticed turkeys to be injuriously affected by eating wheat or barley pickled with bluestone. Quite recently he fed some on barley which had been pickled in a weak solution of bluestone, and next morning twenty were dead. Only the old gobblers were affected, the young ones seeming to have been immune. Members had fed their turkeys freely at different times with pickled grain without any ill effects. They would like to know if any readers of *The Journal of Agriculture* could throw any light on this subject.

LUCERNE.—Mr. Cowan read a paper on this subject. Lucerne was the best of all fodder plants, and, to his mind, was seriously neglected in South

Australia. It grew best on deep black loam or chocolate soil, but at the same time owners of poorer soil should not be discouraged. He would select a plot with a good strong subsoil, and if it was low-lying, so that the drainage from the surrounding land could be diverted on to it, so much the better. The land should be ploughed deeply early in winter, and worked well, to get it down fine before seeding. He found early in August the best time to sow seed. He had good results by drilling in seed with the Massey-Harris drill, with grass seed attachment, sowing 10 lb. seed and 90 lb. super per acre. Early in September, 1901, he put in 20 acres of dark, free soil, over limestone subsoil. The plant came up splendidly, and had a strong root and crown, but the returns had not been so good as expected, owing, doubtless, to the porous subsoil allowing the water to drain away too quickly. In August, 1902, he put in 40 acres on stiff, red land, over clay, with much better results. Although quite young, the only time it had failed to give a green bite for the cows was in March and April of this year. After the April rain it came on very quickly, and he had good feed up to the end of June. His experience had convinced him that 5 lb. of seed was quite sufficient to sow an acre, and he would put 60 lb. of super with it. The young plant should not be allowed to flower the first season. It should be either lightly stocked, or, better still, if the feed can be spared, mow it, and let the cut stuff remain as a mulch. It may need such treatment two or three times during the first summer. To make the best of the lucerne plot, it should be divided into several paddocks, in order to give each a spell in turn. After it is cut or grazed down, it should be harrowed with heavy harrows or disc harrows. If at any time they had more lucerne than they wanted as green feed, it should be converted into hay. Under irrigation the lucerne growing on a farm he was interested in made up to 27 in. of growth in 30 days after cutting. He thought the sunpower of this country, which would keep lucerne growing for nine months of the year, was not half appreciated by farmers. It would pay to raise water for irrigation, provided it can be obtained at a moderate depth. Every man who kept cows, pigs, or fowls should experiment with a small plot of lucerne on well-prepared land, and he was sure he would soon want a larger area. In reply to question, Mr. Cowan advised testing the germinating quality of seeds by putting some between two layers of damp flannel or blotting paper. He thought lucerne should grow well in the hills, where the rainfall was better than on the plains. The freer the soil the less seed needed, as it stood a better chance of developing. Seed should be covered to a depth of 1 in. to 1½ in. For winter feeding barley could be sown on the lucerne without any perceptible injury. After two or three seasons' growth, the lucerne paddock would benefit by severe cultivation.

Dawson, July 23.

PRESENT—Messrs. Renton (chair), Just, Schebella, Severin, Collins, Meyers, Kilderry, Drayson, and Nottle (Hon. Sec.).

STANDARD BUSHEL.—After a lengthy discussion, a motion favouring Kapunda proposal for a fixed legal standard of 60 lb. for the bushel of wheat was carried. Several members opposed the proposal, holding that any wheat going only 60 lb. would be of inferior quality.

Hahndorf, July 25.

PRESENT—Messrs. Byard (chair), Rundle, Gallasch, Bom, Spoehr, Grivell, Sonnemann, Jaensch, and Schubert (Hon. Sec.).

RINGING APPLE TREES.—Mr. Spoehr stated that two of his Nickajack apple trees having been very shy bearers for several years, he tried the effect of ringing some of the arms just as the blooms were falling. The branches so treated carried good crops, while the rest of the trees hardly had any fruit on them. He found the Nickajack the best keeper of all the varieties he had grown.

Meadows, July 25.

PRESENT—Messrs. Ellis (chair), Griggs, Catt, Brooks, and W. J. and C. E. Stone (Hon. Sec.).

EXPORT OF APPLES.—Mr. G. T. Griggs read a paper on this subject. He pointed out that through neglect on the part of the officers of one vessel carrying fruit South Australia had lost £5,000. It was not only the exporter that suffered, but also the labouring classes, as there was that much less money to spend in the State. He had fifty cases on the boat, and expected that on this small lot his loss would be £5. Some growers had been more fortunate, as the returns just covered expenses, but they got nothing for the fruit. The only remedy for the grower, as the shipping companies did not seem to trouble whether they spoiled the fruit or not, was to insure it, as the powerful insurance companies would have something to say about the way the fruit was looked after. In another vessel, which reported fruit arrived in good condition, he sent thirty cases of apples. These realised £7 8s. 6d., and the charges took all but 15s. 2d. This was not very encouraging for the exporter. There would have to be some alteration in the method of marketing our fruit, as at present it appeared to be rushed on the market on arrival of the ship, no matter what quantity was already awaiting sale. Apples sent to Java had been more profitable than those sent to England, netting from 2s. to 4s. 4d. per case, clear of all expenses. He had also exported Vicar of Winkfield pears, but they only just paid expenses. Pears had not kept well this season. He would like some information on the best kinds of pears to grow for export. Considerable discussion followed. Members were of opinion that the Government should legislate to make all shipping companies responsible for any damage to fruit carried in the refrigerated chambers.

Arden Vale, July 2.

PRESENT—Messrs. Warren (chair), Eckert, Fricker, Starr, Willis, Miller, Rogers, and Hannemann (Hon. Sec.), and three visitors.

METRIC SYSTEM.—Paper on the metric system of weights and measures, read by Mr. Davidson at Millicent Branch, was discussed. Members generally supported the paper, the simplicity of the metric system being apparent, and, as practically all European countries had adopted it, members thought it would be advantageous for other countries to fall into line.

MISCELLANEOUS REMARKS.—The Chairman read a paper under this heading, dealing with various topics. They heard a good deal about trade secrets, but as far as the agriculturist was concerned these did not exist, as the farmers, especially if members of the Bureau, freely offered their fellow-farmers the benefit of their experiences. This perfect freedom of intercourse was the main feature of the Bureau system, and the individual who could not glean something of value from the information disseminated at the Bureau meetings was very slow to learn. Not the least important factor in the usefulness of the Bureau was that it was rapidly educating the farmers in the benefits of co-operation, and, with a few good seasons, he thought they would witness immense strides in this direction. They heard a good deal of nonsense about the so-called "individualist," but as a business type he was becoming a rare being. The farmer was met at almost every turn by Association prices for articles he needs, and even in the small townships the storekeepers unite to regulate the prices they will pay the farmers for minor products of the farm. The machinery for co-operative action on the part of the farmers was already available in the South Australian Farmers' Co-operative Union, which, with efficient management, was assured of success. Dealing with the question of the standard bushel, he was disposed to fall in with the Kapunda suggestion for a fixed standard of 60 lb. To his mind it was evident that whatever weight was adopted here by the Chamber of Commerce had no effect on the reputation of their wheat, which depended for support on the quality of the grain. Besides this, it had yet to be proved that the farmer got any benefit whatever from the high reputation in which our wheats were held. Those who lost 1d. per bushel last year by selling their wheat prior to the standard being fixed could appreciate the benefit of a fixed standard. With the present system of a high standard, and docking, the grower got the worst of the deal every time. At present, although it was true a farmer was paid for a 60-lb. bushel, he got no consideration

for quality, and there was no encouragement to aim at prime samples. The injustice of the system was apparent when, as they all knew, it would pay a farmer having wheat weighing 64 lb. to reduce the quality to standard by mixing inferior grain with it. He thought the best system would be to adopt the average of the past twenty years as a fixed standard, and then dock the actual price paid per pound for anything below the standard, and allow a corresponding increase for samples above standard. The present method of testing the weight of samples was unfair and unreliable. It was only in seasons of scarcity, when money was most needed, and accuracy was everything to the farmer, that these things were felt most. They had ample proof that the present tests were not accurate. He had instances come under his notice where different buyers' tests of the same sample varied to the extent of 2 lb. per bushel. To be effectual in securing reforms on such matters, individual action on the part of the Branches was not sufficient. They should bring it forward at the Annual Congress, and secure unanimous, or at least, majority, motions, as the resolutions carried at such a gathering would have more effect than from Branch meetings. As self-interest was generally all-important, it would probably be necessary to carry the matter to Parliament. Mr. Willis stated that he submitted a sample this season to three buyers. Two gave it as 66 lb. per bushel, and the third as only 64½ lb. Such discrepancies had serious consequences to farmers. With a continuance of the present system of docking, the majority of the members favoured a low standard.

MAKING THE BUREAU ATTRACTIVE.—Mr. Miller read a paper on this subject. He noticed in *The Journal of Agriculture* that the question of making the Bureau meetings more attractive and useful was frequently discussed. One method he would suggest was that each should put as much as possible of his preaching into practice, as example was always more valuable than precept. Then, members should be regular and punctual in attendance. Meetings should be held monthly, and every member should take his turn to read papers. The Bureau system was good, and they should do their best to make it a success. They should bring their friends to the meetings and endeavour to interest them in the work. Members thought that any member who attended regularly, even if he did not take much part in the discussions, was a useful support. They generally supported Mr. Miller's remarks.

RECLAMATION OF LAND.—The Hon. Secretary read a paper on this subject. In many of the northern parts of the State there were considerable areas of land which were not utilised. These consisted either of rough, stony hills, covered with porcupine grass and bushes, and of large tracts of land where the vegetation had been destroyed by drift sand. In the Flinders and other ranges there were hundreds of square miles of country growing practically nothing but porcupine grass, and producing only rabbits and other vermin, which will later on prove a source of serious trouble to the settlers in the neighbourhood. If the porcupine grass is burnt off about the end of March or beginning of April, before the early rains, he found that usually a good spring of grass came up. If there were any low trees or bushes, these should be rolled down some time before burning. By adopting this practice they would considerably improve the carrying capacity of the land. On many parts of the big Northern plains, where the natural herbage had been destroyed by the plough, the terrible dust-storms experienced of late years had ruined large areas of country, some patches of drift being many miles in extent. These drifts were extending year by year, efforts to reclaim them having proved ineffective. Ploughing and scaring had been tried, but it was found that the drifting sand cuts any young growth that springs up after rain. He had noticed that on watercourses and where the land is flooded occasionally the effects of drift are not so marked, the trouble being mainly confined to hard surfaces, where the heavy rains will run away, and light showers do no good. He believed they might, perhaps, overcome the difficulty by preventing the water from running off the land. This he would attempt by building low embankments across the contour of the slopes, to retain the water until it had soaked into the soil. With a fall of 1 in. in 200 an embankment 4 ft. in height would keep the water back for a width of 20 chains. He admitted this would prove somewhat expensive, but he thought it would pay. At any rate, he would like to know how they could combat the drift. Members thought the suggestion a valuable one.

ANNUAL REPORT.—The Hon. Secretary's report showed five meetings held, with an average attendance of nine members. Four papers had been read and discussed. Officers were thanked and re-elected.

Amyton, July 28.

PRESENT—Messesrs. Mills (chair), Kelly, Wheaton, A. and J. Gray, Thomas, Bristow, J. T. Walter, and William Gum (Hon. Sec.), and six visitors.

HON. SECRETARY.—Mr. F. Mullett tendered his resignation, as he had left the district. Mr. William Gum was appointed to fill the vacant position.

PREPARATION OF SOIL AND SEED.—Mr. John Gray forwarded a paper on this subject. The light rainfall experienced in the early part of the season showed the value of a fine firm seedbed. On land that could not be worked to a fine tilth the seed did not start well. Such land dries out more rapidly than finely worked soil, and the soil does not come in close contact with the seed, the consequence being that there was only sufficient moisture retained to cause the grain to malt or mould. On the other hand, on land with good tilth, the seed germinated well, as the rains, though light, were steady. As in racing, so with the wheat crop: a good start made all the difference in the results. The farmer cultivated his land, prior to the seeding, for two purposes, viz., to clean it, and to permit it to absorb and retain the moisture. There was no practice that served both purposes so well as early fallowing; the weed seeds being covered early in the season have every chance of germinating, and the farmer can then destroy the plants by grazing or by cultivation. If the land was likely to grow many weeds he would prefer to give it a light working, say two inches to three inches deep, first with the skim plough or scarifier to cover the seed, and plough deeper later on in the season. If the land is fairly clean he would work it four inches deep as early as possible. When it can be done, he would, in fact, commence ploughing directly after harvest, and get as much of the land as he could fallowed during the summer. Dry working in itself did not benefit the soil, but if the land is broken up, when the rain does come the cultivator can be put to work, and the land will benefit by being worked while damp. On the other hand, if the land is not ploughed until the winter rains have soaked it, the process is slow, and, as the moist season is limited, less land can be worked under favourable conditions. Besides, if the land is ploughed after harvest, there will be plenty of time for weed seeds to germinate before fallowing operations are completed. The first rains will also penetrate the open soil further than the unbroken land. The treatment of the fallow after ploughing is a very important question. Where the ground has a tendency to cake readily, the farmers find it better to leave it fairly rough, so that the rain will soak in. If worked down, the ground is likely to set, and the water will run off the surface. In this district, however, the soil usually remained open, but there was still a danger in having a smooth surface, especially on the hillsides. He would not advise leaving the ground lumpy, but, while working it down fairly level, the farmer must avoid getting the surface smooth. Where possible the furrows should follow the slope of the hill to prevent the water from running off. If a skim plough was used, he would make it cut as wide a furrow as possible, so long as all the ground was turned and the weeds killed. He considered the skim plough the best plough for this district. It was true that sometimes best returns were obtained from land that was somewhat rough and lumpy, but this has always happened when the rain has fallen in heavy storms, and on level soil has had a tendency to run off; but as such conditions were the exception, he preferred a fine tilth. During the past dry seasons farmers in the North had not always been able to work their land as they would like. Owing to lack of horsefeed early ploughing has oftentimes been out of the question. At other times the paddock to be fallowed has been the only one with any feed on it, consequently the farmer is greatly perplexed to know what course to pursue. In regard to the preparation of the seed, he would say that any grain that could not be cleaned sufficiently for market should not be used for seed. Any very smutty samples should be tabooed. He would always pickle seed if sowing in damp ground, but thoroughly clean seed may be sown dry without risk. With careful selection, cleaning, and pickling, there was no fear of smut in the crop. He believed the quality and yield could be improved by grading the seed and sowing only the large heavy grains; but, as the improvement in one year would be very small, he did not think it would pay to treat all the seed in this way. The better plan would be to do it on a small scale, saving the seed from the experimental plots for future sowing, and so by degrees improve the standard of the seed. This could only be done in the districts with better rainfall, as in this locality the experimenter would, perhaps, lose in one year all he had gained by several years' careful work. Members generally agreed with all the points of the paper.

Koolunga, July 21.

PRESENT—Messrs. Butcher (chair), Button, Burgess, Jose, Buchanan, Cooper, Butterfield, Atkinson, Shipway, Perrin, and Noack (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed thirteen meetings held during the year, with an average attendance of 10.3 members, their best record to date. The practice adopted twelve months previously of arranging at the beginning of the year who should be responsible for the main business of each meeting to be held during that year had worked well, and had largely conduced to making the past year the most profitable and interesting in the history of the Branch. The members have to give notice three months in advance of what their subject will be when their turn arrives. Officers were thanked and re-elected.

THE LAW OF POPULATION.—Mr. J. W. Atkinson read a paper on "The Law of Population, or, What Shall we Do with our Boys?" The sentiments of the writer did not meet with general approval, and the paper was subjected to a deal of adverse criticism.

Elbow Hill, August 3.

PRESENT—Messrs. H. Dunn (chair), Wake, G. and J. Elleway, A. and W. Spence, J. and W. Ward, G. C. Dunn, and Wills (Hon. Sec.), and four visitors.

ICE PLANT.—Discussion on this subject took place. Members wished to know result of proposed experiment in dealing with this weed at Port Pirie. [The Department has not yet been able to carry out the proposed experiments. — ED.] Some members stated that sheep and pigs would keep the weed under control. Good cultivation was suggested by Mr. Wake as a preventive, but several members held a different opinion.

SEEDING.—Members all stated that under average conditions pickling with bluestone affected considerably the germination of the seed. Some members did not believe in pickling. All were agreed that the seed should be run through the winnower a second time, in order to clean it thoroughly and to ensure that it ran freely through the drill.

OFFICERS.—Messrs. H. Dunn and H. B. Wills were elected Chairman and Hon. Secretary respectively, the retiring officers being thanked for their services.

Longwood, July 30.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Oinn, Smith, Vogel, and Hughes (Hon. Sec.), and nine visitors.

UNDERGROUND GRUBS.—Specimens of short, fat white grubs attacking roots of wattles were tabled, and some discussion took place on the question of whether they would attack the roots of fruit trees. Members had often seen these grubs on wattle roots and sometimes on the teatree, but not on fruit tree roots.

POULTRY-KEEPING.—Mr. H. R. Antuar read a paper on experience in poultry-keeping. For years he had decried poultry-keeping as unprofitable where the food had to be purchased, and certainly his previous experience had been unsatisfactory. He had bought eggs from the stores in the ordinary way, and, although he had nothing to complain of as to the number of chicks reared or the diversity of breed, as egg-producers they were a failure. As table birds they might have paid, as they were healthy, and grew to a good size. Later on he purchased 60 Langshans, but they also proved very unprofitable. As the result of a challenge from his wife to give poultry a fair test, he purchased some sittings of Brown Leghorn and Minorca eggs from good pens of birds. The chicks were carefully looked after, and all unprofitable layers culled. In two years he had a very good strain, keeping for the past season 16 hens and two roosters. He sold eggs to the value of £11 15s. 1d.; fowls to the value of £1 8s. 6d.; and the increase in value of stock he put at £1 4s. The food purchased cost £3 18s. 3d., leaving a net profit of £10 12s. 4d. for the year. The birds were kept in a fair-sized enclosure, and allowed out for about two hours before feed-

ing at night. This treatment appeared to suit them, as they kept in splendid health. Plenty of green feed was supplied from the garden, but this was not charged for, as it was practically all waste, and he had the fowl manure for the garden. He thought there was a good deal in having a regular system, such as fixed times for feeding, kind and quantity of feed, etc. Any sudden change quickly shows in a falling off in the egg yield. He considered the smaller breeds of fowls most profitable as layers, as they laid quite as many and as large eggs, while they eat less food than the larger birds. In connection with poultry-keeping one important matter should be mentioned. If one is going to make a success of the industry, he or she must have a liking and an aptitude for the work. He was sure if his fowls had been left to him to look after the results would have been very different to those secured by his wife. In reply to a question as to the quantity of grain feed, Mr. Antuar stated that twenty fowls received about one bushel in four weeks. Members differed in their opinion as to whether this was sufficient for fowls shut up in comparatively small enclosures. It was stated that every year the residents of this district were giving more attention to poultry. Members agreed that there was more in the strain than the breed, although breed was of great importance. It was pointed out that while in the Victorian egg-laying competition the White Leghorn ate less food than heavy breeds, like the Black Orpington, they laid as well, if not better, and, therefore, for egg-production were the more profitable. At Magill the Silver Wyandotte was stated to have eaten the least, and Minorcas to have eaten most food.

Mount Remarkable, July 21.

PRESENT—Messrs. Challenger (chair), Jorgensen, Giles, Casley, Yates, Foot, McIntosh, Morrell, and O'Connell (Hon. Sec.).

MANURES.—Mr. T. Casley read a short paper on this subject. Nearly every farmer now appeared to consider commercial manures a necessity, and there were hundreds of agents all over the State selling these fertilisers, and making a living out of the producers. The annual outlay on manures was increasing to an alarming extent, and he much doubted whether the actual increase in the crops warranted this heavy outlay. He was not opposed to the use of phosphates, as he knew that in many instances they had enabled the owner to profitably cultivate land that formerly was unprofitable. He had had fairly profitable results himself from their use, but at the same time, he was convinced that too much dependence was placed on these fertilisers, and not enough use made of the natural manures that were produced on the farm. Many farmers object to the labour involved, and he had known some to give away the stable manure to get rid of it. It would be more to their credit, and profit also, if they gathered together all the manure they could make on the farm, and, after rotting it, spread it on the ground. It would, of course, take an enormous amount to cover, say, 100 acres. Still, as the benefit was seen for many years, all the manure that could be made on the farm should be judiciously used and worked into the soil. He thought that much of the credit given to phosphates for the improved crops was due to the improved methods of fallowing and preparing the seedbed. [How, then, does Mr. Casley account for the fact that even on fallow land any strips left unmanured are, as a rule, very much behind the manured areas?—Ed.] He had had as good results from a dressing of 2 cwt. of a mixture of equal parts of powdered sheep manure and ashes, mixed with one-eighth its bulk of dry, slaked lime, as he had obtained from various chemical manures. Another manure every farmer might make was obtained as follows:—Place a layer of bones about six inches thick on a level spot, cover with about three inches of quicklime, then add a layer of loam four inches thick: put more bones, then lime, and loam, until the heap is complete, covering the whole with a thick layer of fine soil. Make a number of holes right down the heap, then pour in water to slake the lime. The whole mass will become very hot, and in about three months the bones will all be softened, and the heap may be slicked down with a spade. This will prove a splendid fertiliser, and very much cheaper than any they could buy. He would strongly urge every farmer to carefully store up all bones and utilise them in this way.

SHEEP ON THE FARM.—Mr. McIntosh read a paper on this subject. There was no other animal on the farm that returned more profit than the sheep, if

properly managed. The present extreme prices for sheep were, of course, due to the heavy losses of stock experienced during the previous four or five years, though at average prices there was still good profit in them. The amount of manure from sheep droppings was a valuable adjunct. He found that if sheep were kept in a yard or shed, allowing 8 square feet of floor space to each sheep, and the floor well littered with cocky chaff, they would in the course of twelve hours leave on the floor a solid mass of manure of great value. Sheep grazing on the fallow or on the paddock to be cultivated will help to clean the land, and at the same time enrich it with their droppings. A few sheep for ration purposes would save money, and provide a very welcome change of meat for the household. The returns from the lambs and the wool make a nice addition to the revenue of the farm. On small farms it might be well to adopt some system of movable yards, so that the sheep could be shifted from place to place, ensuring that the whole of the paddock is equally manured and the feed used to best advantage.

Penola, August 13.

PRESENT—Messrs. Darwent (chair), McBain, McKay, Peake, Miller, Ricketts, Richardson, Worthington, Stoney, Alexander, Pounsett, and Allnutt (Hon. Sec.).

AGRICULTURAL COLLEGE.—It was resolved that this Branch desires to place on record its appreciation of the action of the Government in appointing Professor Perkins as Principal of the Agricultural College, and the members look forward to an increased confidence on the part of the public in a valuable institution.

WAYBILLS FOR TRAVELLING STOCK.—Discussion took place on paper from Kingston Branch on this subject, and it was resolved that in the opinion of this Branch the police officer in charge of the district should be notified by the owner of brands and description of any stock leaving a district either by road or rail, and also the destination of such stock.

Riverton, August 20.

PRESENT—Messrs. A. J. Davis (chair), H. A. and W. B. Davis, Gray, J. W. and J. E. Kelly, Gravestocks, and Cooper (Hon. Sec.), and three visitors.

ROLLING CROPS.—Mr. F. Gray read a paper on this subject. Rolling a wheat or hay crop when young benefits it in several ways. It consolidates the soil around the roots, causes the wheat to stool out better, and destroys many insects that would injure the crop. Rolling also assists to fit the land for the crop in two ways. First, by compacting the soil, so that other implements do better work, and in breaking the clods. Rolling after seeding assists to bring the moisture to the surface. Rolling heavy land in spring will prove injurious if abundant rains follow, whereas the result is beneficial if the weather remain dry for some time. The roller may be used to assist in the liberation of plant food, in the improvement of the physical condition of the soil, in increasing the movement of moisture to the surface, hastening germination of small seeds, and preparing a smooth surface, the latter being of value in saving wear and tear on harvesting implements. A lengthy discussion took place, members being unanimous in their appreciation of the good resulting from the use of the roller, both before and after seeding.

Forster, August 13.

PRESENT—Messrs. A. Schenscher (chair), Retallack, F., W., and J. Johns, sen., E. Schenscher, and J. Johns (Hon. Sec.).

STRANGLES.—Members wished to know symptoms of strangles; whether the complaint was infectious; and the best treatment. [See article in this issue.—Ed.]

FIELD TRIAL.—A field trial of ploughs and cultivator took place under the auspices of the Branch on July 28, there being a good attendance of visitors.

Virginia, July 25.

PRESENT—Messrs. Hatcher (chair), Taylor, Nash, White, J. E. and D. J. J. Sheedy, Pavy, Huxtable, Strempel, Thompson, Odgers, Johns, Baker, and Ryan (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that twelve meetings had been held during the year, with an average attendance of twelve members and ten visitors. Nine papers had been read and discussed, and a lecture on "Soils and Manures" given by Professor Towar, at which fifty-three persons were present. Officers thanked and re-elected.

HORSES.—Mr. J. E. Sheedy read a paper on this subject. He was of opinion that it would pay farmers well to give more attention to horse-breeding. Doubtless owing to the very low prices of former years, causing many to give up the breeding of horses, prices were now remunerative, and, with the great demand from outside markets, it appeared reasonably certain that good young horses would continue to pay well. Taking into consideration the average prices of farm produce, he was of opinion that horses for farm work were not worth the high rates ruling, a real good pair of draughts fetching £60 or more. Farmers could breed their own horses much cheaper than they can buy, and, by making a practice of rearing one or two each year, they would be able to cull out and dispose of any they did not want by the time they were ready for work. The best mares on the farm—well-shaped, active, and, above all, sound—should be used for breeding purposes. He would mate the mares to a good Clydesdale stallion, and be prepared to pay a little extra to get the service of a good horse, as the foals take after the sire to a greater extent than after the mare. He did not think the very heavy draughts suitable for their farms, as they get slovenly with continuous heavy working. They required an animal of medium height, with good neck and chest, straight shoulders, long, straight barrel, well ribbed, and with fairly clean bone. Some farmers prefer light horses for farm work, but they would require to keep a greater number on the farm, and they were not so suitable for heavy road work. This was an important consideration where farmers had to cart their produce any considerable distance. Foals should be weaned when six months old, and must be well fed for the first year or two, as good early growth is the making of a horse. He should be broken in at two and a half years, and given only light work for six months or more. Avoid giving him much heavy pulling until four years old. In regard to feeding, he preferred mixed oats and wheaten hay chaff. He would sow wheat and oats mixed to provide the hay. Feeding at night on good long hay was advisable, but it was difficult to get suitable hay for feeding, as, with the use of manure and the seed drill, the hay was usually rather coarse for long feeding. Long hay is also somewhat wasteful compared with chaff. Horses should be fed at regular hours, and should not be given too much at a time. No hard-and-fast rule as to quantity could be laid down, as one animal does well on very much less than another. In wet and cold weather horses should be stalled, but in fine weather they would benefit by being allowed to roam at will in the paddock. Continually standing in a stable on a hard floor often caused swollen and puffed joints. Paper was well discussed, and met with general approval. Most of the members were strongly of opinion that it paid better for the farmer to rear his own stock.

Colton, August 6.

PRESENT—Messrs. Hull (chair), Andrew, M. S. W. and P. P. Kenny, and Packer (Hon. Sec.).

BRANCH MEETINGS.—Further discussion took place on proposal to hold meetings quarterly instead of monthly. Mr. Hull referred to benefits derived from meeting together in connection with the Bureau. Only recently in a discussion on seeddrills it was stated by one member that he found his drill was sowing 15 lb. per acre of pickled seed less than was shown on the index plate. Another member tested his drill in consequence, and found that, instead of sowing 40 lb. of seed per acre, he had been sowing only 25 lb. Mention of this fact at the Bureau meeting had been the means of saving him from considerable loss through too thin seeding.

Mannum, August 6.

PRESENT—Messrs. Faehrmann (chair), Ramm, Haby, Wilhelm, Lenger, Dixon, and Preiss (Hon. Sec.), and four visitors.

STANDARD BUSHEL.—Three members supported, and four opposed, the proposal for a fixed standard of 62 lb. per bushel. Some of the members thought the present system of ascertaining a fair average standard each year the correct one, but they condemned the method of docking wheat under the standard; as a rule the reduction made by the buyer was unreasonable.

CULTIVATING SANDY LAND.—Discussion took place on the best treatment of sandy loam soil in dry districts. Bare fallow was generally condemned, as the land drifted badly during the summer. The fine surface soil, containing most of the humus, being blown away, the land quickly becomes unproductive.

Orroroo, July 29.

PRESENT—Messrs. Moody (chair), Lillecrapp, Jamieson, Roberts, Matthews, A. and W. Robertson, Copley, Oppermann, Harding, Brown, and Tapscott (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Discussion took place on Crystal Brook proposal, and a motion was carried favouring a fixed standard of 62 lb.

JUNE WHEAT.—Mr. B. W. R. Dunn tabled a sample of wheat of fair qualities from a crop reaped the previous month. The farmer had brought the wheat into the township for sale.

Arthurton, July 29.

PRESENT—Messrs. Hawke (chair), Lomman, Short, Freeman, Rowe, T. and S. T. Lamshed, Pearson, and Palm (Hon. Sec.).

FIELD TRIAL.—Members favoured holding a field trial of harvesting implements on Messrs. Lomman & Freeman's farm, near Wallaroo, under the auspices of the Bureau Field Trial Society.

TRAVELLING AGENTS.—Mr. Freeman strongly commented on what he termed the agency nuisance, and moved:—"That the members of this Branch pledge themselves not to do any business with any travelling agent." It was decided to discuss the matter at next meeting.

Denial Bay, July 30.

PRESENT—Messrs. Smith (chair), Starling, Lowe, Croker, Meier, Hoffrichter, Dunnett, G. J. and W. O. Gale (Hon. Sec.), and visitors.

COMPLETE HARVESTER.—By request, Mr. L. Will read a paper on this subject. This machine had many advantages over the stripper and winnower. It will take off the crop under all conditions of weather, other, of course, than wet weather, and produces, on the average, a better sample than does the ordinary winnower. It should prove a great boon in districts where much damp weather prevails, as there would be much less loss of time than with the ordinary stripper. In working, he found that instead of dropping the bags all over the paddock, as they were filled, it was a good plan to pull out always at a certain place, until they had enough bags in the heap, to make a convenient load for carting; then a new stopping-place, close to the crop, should be selected. A lot of objection was raised in some quarters to the harvester on the ground that it dirtied the land, blowing the seeds of oats and other weeds out with the chaff; but this was very easily overcome by attaching a chaff-carrier, and dumping the chaff in heaps. He considered the draught of the harvester about 25 per cent. greater than that of a stripper of about the same size. The harvester was not more liable to damage than the stripper, provided reasonable care is exercised. A large number of questions were answered by Mr. Will, who was thanked for his attendance.

Appila-Yarrowie, July 27.

PRESENT—Messrs. Francis (chair), Wilsdon, Bottrall, Brinkworth, Daly, Lawson, and Fox (Hon. Sec.).

STANDARD BUSHEL.—Resolution of Crystal Brook Branch was discussed. Members favour a fixed standard of 62 lb. per bushel. Any sample going only 60 lb. would be inferior.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. P. Lawson. The special object of the visit was to inspect the shipment of Dorset Horn sheep recently imported by Mr. Lawson. After inspecting the stock and other matters of interest, members were entertained at tea, and a hearty vote of thanks accorded to the host and hostess for their kindness.

Scales Bay, August 8

PRESENT—Messrs. Roberts (chair), Crowder, and Newbold (Hon. Sec.).

BUSHEL OF POLLARD.—Some discussion took place on the weight of a bushel of pollard. The Chairman stated that it was usually sold at 20 lb. per bushel, but Mr. Newbold has measured 20 lb. of pollard, and found it does not go more than two pecks. [Bran and pollard are always sold by bushel of 20 lb.—Ed.] Discussion took place on question of membership and attendance.

Quorn, July 23.

PRESENT—Messrs. Thompson (chair), Brewster, McColl, Venning, Toll, Cook, and Walker (Hon. Sec.).

DAIRY COWS.—Mr. Venning read a short paper on his experience with different breeds of dairy cows. He had had good cows in both Shorthorn and Hereford strains, but was of opinion that for dairying only the Jersey was most profitable. A Holstein heifer he had was yielding very well, and if he could manage it he would get a good strain of this breed into his herd. A very great factor in the results from any breed was the feed they received; the way in which they were treated by the milkers was another important item. Some discussion ensued, a number of questions being answered by Mr. Venning.

Reeves Plains, July 29.

PRESENT—Messrs. Folland (chair), Winton, Cordon, Arnold, R. and W. Oliver, McCord, Alexander, Wurfel, W. and W. H. Day (Hon. Sec.).

FIELD TRIAL.—A very interesting trial of agricultural implements was arranged by the Branch on the farm of Mr. R. Oliver, near Wasleys. Altogether twenty implements were shown at work, including stumpjump and set ploughs, stumpjump and set scarifiers, cultivators, and seeddrills. About 400 persons were present. No judges were appointed nor prizes offered, those present being left to form their own opinions as to the merits of the different implements on the work done. Considerable discussion took place at the Bureau meeting on the results of the field trial.

Meningie, August 12.

PRESENT—Messrs. Williams (chair), Ayers, Scott, Botten, Shipway, May, Hacket, Hiscock, and W. and C. Tiller (Hon. Sec.).

CONGRESS.—Some discussion took place in respect to delegates to Congress not attending a reasonable number of meetings; but it was decided that this was a matter that must of necessity be left to the honour of the delegates. Members thought the annual visit to Roseworthy College should take place on the day before the opening of the Show, instead of on the Monday following, and that delegates to Congress should have first right to visit the College.

Tatiara, August 13.

PRESENT—Messrs. Fisher (chair), Saxon, Makin, Penny, Hughes, Reschke, Smith, Stanton, and Bond (Hon. Sec.), and two visitors.

CONDITION OF MANURES.—Discussion took place on the question of the condition in which manure was delivered. It was contended that the guarantee of the merchant as to condition was insufficient, as it ended when the manure was put on truck, while the Railway Department repudiated all responsibility for risk of damage in transit. The result was that the farmer often received the manure in condition that not only caused him much loss of time, but it was often impossible to make it work evenly through the drill. It was unanimously resolved:—"That, in the opinion of members, farmers should purchase from the agent at place of delivery, leaving the agent to protect himself by obtaining from the maker or importer a guarantee that the manure was placed on truck in good condition. Members suggested this subject for discussion at Congress.

Cherry Gardens, August 9.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Potter, Wright, Richards, Jacobs, Hicks, Burpee, Broadbent, Brumby, Matthews, and Ricks (Hon. Sec.), and one visitor.

PUBLICATION OF REPORTS.—Discussion took place on letter from Secretary for Agriculture in respect to non-publication of recent reports from this Branch. Members were dissatisfied with the reply, and thought that even where nothing but matters of local interest were dealt with reference should be made in *The Journal* to the meeting, in order to show that the Branch was still in existence. [This is entirely a question of expense. With the small sum of money available for printing *The Journal of Agriculture* economy is absolutely necessary. If more money was available reports of meetings could be published at greater length.—ED.]

SEPARATOR V. FACTORY.—Mr. Potter initiated a discussion on this subject. All the members took part in the discussion, and it was generally agreed that if, through the use of the home separator, the butter factories were allowed to go down, considerable injury would be done to the export trade, as there would be so much variation in the quality of the butter. Members thought that the final result would be that butter would fetch such low prices as to be unprofitable.

Kingscote, August 11.

PRESENT—Messrs. Turner (chair), P. T. and C. J. Bell, Neave, Hawke, Nash, Melville, Olds, Wright, Bates, Ayliffe, and Cook (Hon. Sec.).

MANAGEMENT OF HORSES.—Mr. J. Melville read a paper on this subject. He would break the colt in at three years old, and preferred that he should have never been handled previously. The first thing was to mouth the animal properly, and considerable care must be exercised in this work. The girthing band should be kept tight, and the bearing reins evenly buckled up. Nothing less than a 5-in. bar bit should be used. This should be buckled up to make the colt arch his neck slightly. In this position he should be driven about the yard quietly, and always kindly. If handled in this way for a few days the mouth will be tender. A large snaffle bit can then be used, and the animal driven in harness with a light load. It was always best to work him alongside a steady worker. Care must be taken that the collar fits the horse, and the animal's shoulders should always be well brushed or cleaned before the collar is put on. All horses should be worked with even chains, and care taken to prevent sore shoulders. Uneven chains and badly fitting collars carelessly put on will ruin the horses' shoulders quickly, especially if the animals are in somewhat low condition. In using horses in the dray, with the leaders' chains fastened to the shafts, care must be taken that the leaders do not pull down on the shafter's back. To guard against this, lengthen the back chains to allow the shafter to be pulling slightly upwards. He did not believe in loading heavy on, especially with two or three horses in

the lead. In heavy carting keep the horses at a steady pace, and do not attempt to hurry them. In starting the team with a load, see that all the horses are up in their chains. If one or more are slow in starting care must be taken to teach them to understand quickly what is wanted of them. He considered the medium draught horse the best for general work of the farmer. They did not get so leg weary as the heavy draught, and were better foragers in the paddock. For heavy work he would always choose a round-boned horse, as hardier and quieter than a flat-boned animal. Feeding was an important matter. Short feed was absolutely necessary for working horses. He found it best to feed chaff mixed with a few oats in a nosebag morning and midday, and at night long hay. If driving an aged horse, more oats should be given, or, instead of long hay, it might have oats and chaff until bedtime. Considerable discussion ensued, and a number of questions were answered by Mr. Melville.

ACREAGE REGISTERS ON SEEDDRILLS.—Discussion took place as to whether the drills registered the correct acreage. Most members agreed that in dry weather the registers were fairly accurate, but when the ground was sticky or stumpy the results were not too reliable.

AGRICULTURAL COLLEGE.—It was unanimously resolved that this Branch heartily favours the course taken by the Government in appointing Professor Perkins Principal of the College.

Balaklava, August 13.

PRESENT—Messrs. Robinson (chair), Anderson, Baker, Black, Manley, Neville, Reid, Tuck, Thomas, and Burden (Hon. Sec.).

CO-OPERATION.—Mr. Manley read paper from back issue of *The Journal* (South-Eastern Conference, 1899) on this subject, and considerable discussion ensued. It was unanimously agreed that much good could be accomplished by co-operative effort. Mr. Neville thought they could save a good bit of expense by combining to purchase cornsacks, woolbales, manures, and bluestone: a co-operative retail store, if properly supported, might work. Mr. Tuck instanced the increased price they could obtain if they combined to store their wheat to place larger parcels on the market. The Chairman said even if they could not see their way to joining a co-operative institution there were no difficulties in the way of ten or a dozen farmers in one locality combining to purchase manure or cornsacks in one parcel at considerably less cost than the individual could buy.

MEMBERSHIP.—Members agreed to Wilmington proposals except that they would not permit candidates for membership to propose themselves for election.

Maitland, August 6.

PRESENT—Messrs. Bowey (chair), Jarrett, Heinrich, Hill, Moody, Hastings, and Tossell (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the Chairman's residence, and an inspection made of the homestead, stock, and machinery. An oil engine, used for working a chaffcutter, corncrusher, etc., came in for favourable notice.

ENSILAGE.—Mr. Hill read a paper on this subject. He was afraid that generally they did not give sufficient attention to providing food for their dairy cattle. He had for many years made a little ensilage for his cattle, for use during the summer, and had very satisfactory results therefrom. Last year he cut two acres of green feed with the binder and carted it direct to the ensilage pit, weighing it down with about 2 ft. of earth. He considered earth the best material for putting on pressure, as it also excluded the air. It was much less trouble to use the binder than to cut and cart the stuff loose. The pit of ensilage provided twelve cows with one good feed each day for three months, the animals keeping in good condition. He strongly recommended farmers to cut a few acres of green stuff, and convert it into ensilage.

Murray Bridge, July 30.

PRESENT—Messrs. Jaensch (chair), Edwards, Kutzer, H. and W. Schubert, Wundersitz, Mann, and Lehmann (Hon. Sec.), and one visitor.

SIZE OF WHEATSACKS.—Mr. Wundersitz initiated a discussion on proposal to reduce the size of the wheatsack. The loss that the adoption of such a proposal would entail on the farmers was referred to, but members did not think that there was any general desire to reduce the size of the present wheatsack.

DISTRIBUTION OF SEEDS.—Mr. H. Schubert distributed amongst members seeds of a number of different kinds of vegetables he had obtained from America.

Kapunda, August 6.

PRESENT—Messrs. O'Sullivan (chair), Flavel, Banyer, Kerin, Teagle, Vogt, Windebank, Pascoe, Daly, Weckert, Harris, and Holthouse (Hon. Sec.).

STANDARD BUSHEL.—Further discussion on this subject took place, replies from various Branches being read. It was generally agreed that a better system was necessary, but several members differed from Mr. Teagle's views that the sample should be 60 lb., as such would be inferior for South Australian wheat, and would not sell at full market rates. Members were all agreed that there should be a fairer system than that which obtained at present in reference to docking of wheat under standard.

Mount Pleasant, August 12.

PRESENT—Messrs. Lyddon (chair), Drogemuller, Royal, Naismith, Maxwell, Miller, Tapscott, and Vigar (Hon. Sec.).

PRIVATE SEPARATORS.—Discussion on this subject was initiated by Mr. P. Miller, who contended that the private separator was not a success with a butter factory near by, as it was impossible for the manager to make such good or even quality butter from cream received from various sources as from cream from milk separated at the factory. Mr. Naismith pointed out that the factory manager could not get the full percentage of butter out of a mixed lot of cream of varying degrees of ripeness. Members generally favoured the factory system, though the benefits of the separator to dairymen not within easy reach of the factory were admitted.

RUGGING COWS.—Members are not favorably impressed with this practice, as they think that cows that have been rugged would be very susceptible to cold if the rugs were left off by mistake, or were rubbed off by the cows.

Angaston, July 23.

PRESENT—Messrs. Snell (chair), Sibley, Player, Smith, Salter, Rundle, Evans, Trimmer, Friend, Vaughan, and Matthews (Hon. Sec.).

ANNUAL REPORT.—Nine meetings held during the year, with an average attendance of 8.2 members. Two papers had been read, and, as a result of one on co-operation, a committee had been appointed to endeavour to give effect to a scheme for a local Fruitgrowers' Co-operative Society. The public meeting arranged to discuss the proposed Vegetation Diseases Bill decided to oppose the measure. Regret was expressed that the Government had not enforced the law in respect to the sale of infested fruit. Messrs. J. Rundle and E. S. Matthews were elected Chairman and Hon. Secretary respectively for ensuing year.

Willunga, August 5.

PRESENT—Messrs. W. Binney (chair), T. Binney, Pengilly, Richards, Manning, Allen, Vaudrey, Brown, and Hughes (Hon. Sec.).

WATTLE CULTIVATION.—Mr. H. Richards read a paper on this subject. Many years ago the wattle covered considerable areas of land in this district; but the residents who sold bark at 30s. per ton little expected that the cultivation of the wattle would in these days claim the attention and skill of the landowner. With bark at present prices, he had little doubt that systematic cultivation of the wattle would pay well. In the first place, it was necessary to secure suitable land for planting. He did not believe wattles would grow profitably on any poor soil, as some appeared to think. In his opinion, the best soil was a loose sandy or light gravelly soil over a good clay, and, if possible, the land should be sheltered by the natural undulations of the country, or by a belt of scrub, from scorching and drying winds. He had noticed that in sheltered places, especially on the slopes of the gullies, the wattles made much better growth than on exposed positions. His experience with wattles on the sea side of the range had convinced him that they will never do so well there as on the top of and on the other side of the range. In former years they grew well enough; but then they were sheltered to a large extent by the heavy timber. He would always leave on land intended for wattles a reasonable number of large stringybark or gum trees, if such existed, as they afford a much-needed protection, especially to the young trees. In the range there were many thousands of acres of scrub lands which could fairly be classed as the natural home of the wattle, and on these lands wattle cultivation was a fairly safe field for investment. The expense of clearing this land would not be heavy, the small timber and undergrowth requiring to be cut down and roughly grubbed. After burning, the ground can be broken up with a stump-jump scarifier, the wattle seed soaked in boiling water and sown on the surface, then scarified in. The after attention required was very little. In reply to questions, Mr. Richards advised thin seeding—one plant to the square yard was quite sufficient. In stripping, operations should not be commenced until the bark at the base of the tree starts to crack, as, if taken earlier, it is not so weighty nor of such good colour. Under ordinary conditions the trees will not be mature until seven years old; but, for thinning out, some of the trees may be barked at four years. As the bark on some trees was twice as thick as that on others, one member contended that it would pay to select seed from only the thick-barked trees.

Baroota Whim, August 18.

PRESENT—Messrs. Simper (chair), Brideson, Spencer, Dahlenburg, Raneburg, and Hoskin (Hon. Sec.).

MEMBERSHIP.—It was decided that members absent from two consecutive meetings be struck off the roll.

ICEPLANT.—Members wished to know if there was any effective way of destroying this weed. [Not so far as we know, though the small experiment carried out at Port Pirie with a solution of bluestone promised well. Experiments on a larger scale will be undertaken by the Department during September.—Ed.]

HIGH v. LOW GRADE SUPER.—Members would like to know which grade of super was best for dry climates, viz., 32 per cent. water soluble phosphate, 36 per cent., or 45 per cent.; and also what quantity per acre. [The quantity per acre will depend largely upon the soil and rainfall. In a dry district it would be as well to use about 70 lb. per acre on most of the crop, treating portions at the rate of 84 lb. and 112 lb. respectively, in order to ascertain which quantity gives the highest net returns. Until we have more experience of low-grade super, farmers in dry areas had better confine their attention to the higher grades. In this connection, it must not be overlooked that freight plays an important part, as in a 32 per cent. super there is a much greater weight of what may be termed waste material to pay freight on.—Ed.]

SAND IN HORSES.—A number of horses have died through eating sand, and members asked if there was any certain treatment for this trouble.

Wandearah, August 1.

PRESENT—Messrs. Munday (chair), Wall, Dick, Stanley, Roberts, Robertson, Fuller, Birks, E. H. and E. J. Eagle (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Discussion took place on resolution from Crystal Brook Branch. It was decided to support the proposal for a permanent standard of 62 lb., which, it was pointed out, was practically what this Branch advocated over two years ago.

MEMBERSHIP.—Resolutions from Wilmington Branch were agreed to.

Arthurton, August 19.

PRESENT—Messrs. Hawke (chair), Freeman, Lomman, S. T. and T. Lamshed, Pearson, and Palm (Hon. Sec.).

THE "AGENT" NUISANCE.—Mr. Freeman initiated a discussion on what he termed the "agent" nuisance. The visitation of agents for various farm supplies had assumed such proportions as to have become a positive nuisance to the farmers, causing them much loss of time, and putting them to inconvenience. Besides this, no one would deny that the expenses of these agents were all added to the price the farmer had to pay. Members generally agreed with Mr. Freeman, and it was unanimously resolved that the members pledge themselves not to deal with any travelling or local agent for farm machinery, manures, etc., excepting only stock agents, who must of necessity inspect before purchasing. It was also resolved that, as two seasons' experience had proved in the most practical way possible that a considerable saving could be effected by purchasing farm requisites in quantities, one or more members of this Branch be appointed to purchase farm requisites for members and any other reputable farmers in the district who may desire to participate in the benefits arising from such action. It was decided that no charges other than out-of-pocket expenses be added to the cost of the goods.

Burra, August 19.

PRESENT—Messrs. McDonald (chair), Dawson, Arnold, Heinrich, Needham, and Harvey (Hon. Sec.).

POULTRY KEEPING.—Mr. F. G. Dawson read a paper on "Does Poultry Keeping Pay?" Many people speak disparagingly of purebred poultry, and while it must be admitted that many so-called purebred fowls were very poor specimens indeed, it was a mistake to condemn purebred poultry on that account. With proper care in selection and mating, an attractive, profitable, and robust flock of birds can be secured, and while it would be folly to contend that fowls will not be profitable unless pure, there could be no question that pure blood was as valuable in poultry as in other stock. The usefulness of many breeds had been greatly restricted by the standards imposed for show purposes. The unnatural pampering and treatment that show birds were often subjected to had a bad effect. Injudicious inbreeding had something to answer for; but in spite of all this he was certain that purebred poultry were worth rearing. Apart from the monetary point of view, a few years' experience with poultry will be of great assistance to anyone who may later on take up other branches of stock raising, as the man who succeeds in poultry will have learnt many lessons which would prove of value in connection with other stock.

STOCK COMPLAINTS.—For roup in turkeys the following treatment has proved effective:—Mix a strong brine, and place the turkey's head in it until it begins to struggle for breath, then take it out for a few seconds, and repeat the treatment. Dry the head thoroughly, and place the bird under shelter on some dry straw. The brine should be kept warm—just comfortable to the hand. A number of lambs in the district are affected by "Cuckoo scale" (sore mouth); it was recommended to treat with carbolic dip. For ringworm in cattle, the application of carbolic acid and oil to the affected parts was advised.

Forest Range, July 21.

PRESENT—Messrs. Monks (chair), Townsend, Vickers, Waters, J. and A. Green, Collins, Trevenan, Rowley, and F. Green (Hon. Sec.).

SPRAYING FOR CODLIN MOTH.—Mr. G. Monks read a paper on this subject. He was firmly convinced that, so far as the Hills districts east of the top of Mount Lofly Range were concerned, spraying with arsenical mixtures for codlin moth before the middle of November was waste of labour and materials. During the years he was travelling about the gardens as Inspector of Fruit he took particular note of the dates when the first caterpillars were found in the bandages, the earliest in any season being on December 14. Allowing four weeks from the laying of the eggs to the full development of the caterpillar, this carries them back to the middle of November, when the first eggs were laid. His own observations had satisfied him that few eggs were laid in the bloom or the calyx, as was formerly supposed, and he was certain that in ordinary seasons the calyx leaves have closed over before any eggs have been laid. Except with varieties such as the London Pippin, with wide open calyx, he was absolutely certain that fully 80 per cent. of the caterpillars burrow in from the sides of the fruit, and certainly not more than 20 per cent. of even the first brood enter by the calyx. Apart, therefore, from the waste of time and money resulting from early spraying, the young shoots and leaves would be injured by the spray unless the greatest of care was exercised in making the spray mixture. In their own neighbourhood at all events he was satisfied that greater care must be taken with their spraying than was perhaps necessary in drier localities. In many cases sufficient lime was not added to the arsenite of soda solution. He found that unless he used at least 6½ lb. of lime he had not got 4 lb. left after straining properly. He put 8½ lb. of lime to 40 gallons of mixture for the final spraying last season, and had splendid results, as, notwithstanding the wet weather that followed, it did not easily wash off. If he were working a large orchard with a good pump he would not hesitate to use 12 lb. of lime to every 40 gallons of mixture. Any excess of lime would benefit their soils, get rid of various insects and fungi, and would neutralise the arsenite of soda better, besides causing it to remain on the fruit longer. Sometimes mistakes were made in preparing the spray mixtures. He slaked the lime first with a little water, and then added the arsenite of soda to assist the slaking process. He believed that this ensured that the arsenite of soda was wholly changed to arsenite of lime. Another mistake often made was in not keeping the mixture thoroughly agitated when spraying. He had noticed that the lime commenced to settle within a minute of the pump being stopped. With plenty of lime added to the arsenite of soda and the mixture properly agitated, no fear need be entertained of the fruit or foliage being burnt to any extent. Members were generally in accord with Mr. Monks. [We are afraid that members of Longwood Branch will remain unconvinced on the question of when the codlin moth begins to lay, and would suggest that they should during the coming season keep a careful lookout for "wormy" fruit, and send the earliest specimens they can find to Mr. Monks.—ED.]

Morgan, August 20.

PRESENT—Messrs. Windebank (chair), Hahn, Lindner, Stubing, Bruhn, Pope, Hewitt, Hausler, Plummer, Seidel, R. and H. Wohling (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Mr. W. G. F. Plummer read a paper on this subject. He thought they should have a fixed standard for wheat, and that the weight of that standard should be fixed by the vote of the farmers themselves. Personally he would favour 63 lb. or 64 lb. per bushel for the permanent standard. Any samples lower than the standard should be subject to reduction in price, while better quality wheat should be paid for at a higher rate. There must be some incentive to the farmers to place high quality samples on the market. At present if the standard is 62 lb. he got full market rates for 62-lb. wheat, and no more for wheat weighing 65 lb. per bushel. Would not the farmer be very foolish to clean his wheat thoroughly under such conditions? By leaving in a good bit of rubbish he was paid for his waste at market rates for wheat, whereas if he cleaned his wheat thoroughly he

had a lot more screenings on his hands, went to more trouble, and actually got less money for his parcel of wheat. It was not in accordance with human nature to expect the farmer to be at a monetary loss for the mere satisfaction of having a fine sample of wheat. There must be some pecuniary incentive if the average of our wheat is to be raised. He thought they should do all in their power to keep the f.a.q. standard as high as possible, because it was the basis of all trading in wheat.

Port Broughton, August 20.

PRESENT—Messrs. Tonkin (chair) Barclay, Hoar, Button, Harford, Gardiner, Pattingale, Dolling, Rankine, Evans, Whittaker, and Dalby (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—This Branch favours a fixed legal standard of 61½ lb. or 62 lb. per bushel for wheat.

THE AGENT NUISANCE.—Mr. Whittaker moved that travelling agents for farm requisites were inimical to the best interests of the farmers. He contended that the expenses of all the agents travelling the country were really paid by the farmer, who could, without loss or inconvenience, attend the principal shows, and buy all the machinery, etc., that he required. Considerable discussion took place, members generally being opposed to the motion, which was withdrawn.

Whyte-Yarcowie, August 20.

PRESENT—Messrs. Hack (chair), Dowd, Makin, Mitchell, Faull, Jenkins, G. Mudge, Lock, McLeod, Pascoe, Kornetzky, Hunt, and Boerke (Hon. Sec.), and three visitors.

CONSERVATION OF WATER AND WASHING OF LAND.—Mr. D. Dowd read a paper dealing with the conservation of water on the farm and the prevention of damage by water. Even where water can be obtained by sinking, most farmers have one or more tanks or dams for the conservation of water. On very few farms is it not possible to select a suitable site on which water that now runs to waste could be conserved? The first thing to do was to test the ground by sinking a few trial holes, to ascertain whether the proposed site was on good holding ground. The deeper the dam the better; water in a long deep narrow dam suffered less loss by evaporation than in wide shallow dams. Collecting drains must be ploughed; these should be wide but shallow. If opened out lower than necessary there was great danger of washing deeper after each run of water, resulting in the dam silting up, and possibly deep gutters being formed. Dams require cleaning out about once in three years, as the vegetable matter and silt that accumulate absorb a good deal of water, lessen the holding capacity, and also cause the water to become unfit for use much quicker than in a clean dam. Attention must be given to the drains to see that they are always in good order. The best time to clean out drains is after each fall, as then the farmer could go to rest on a wet night satisfied that everything was in order. Dealing with the other side of the paper, Mr. Dowd referred to the fact that at times they had paid as much as £7 per ton for hay, and it was therefore necessary to consider how best to conserve stocks of both hay and cocky chaff. Often the chaff heaps were greatly damaged by water. It would pay every farmer who has a supply of hay and cocky chaff to put on one or two extra hands to cut and gather all the straw possible. This should be used for covering the hay stacks, chaff heaps, and also for sheds. If it can be done it would be found better to gather sufficient straw one season, and stack it for use next year, so that as soon as the hay has been stacked it can be protected with a good coating of straw. When the stack has settled down, the roof and sides should be covered with straw and secured by lengths of wire-netting sufficient to go from the top to the eaves on both sides. Rails attached to the netting will keep it in place and prevent damage by wind or by fowls. If the netting is carefully rolled up and put away as the hay is consumed it will last for many years. The cultivation of land, destroying as it does the natural herbage that formerly existed, renders the soil liable to be washed away as a result of heavy rain. There were places in his own paddocks where quite large creeks and gutters had been washed out. He

advised raking up as much straw as possible and placing it at about a chain apart in the gutters, filling them up to the level of the surrounding land. Some earth should be placed on top and at the back of the straw to keep it in its place. In time the spaces between the breaks will silt up, causing the water to spread over a wider area and to run slower and shallower. By a little attention the water can be so diverted as to do but little damage, and at the same time benefit a considerable area of land.

STACKING SHEAVED HAY.—Mr. J. Kornetzky read a paper on this subject. Their object was to preserve the hay in good condition at the least possible expense. First, care must be taken that the hay is properly cured before being stacked, as otherwise it will heat up and discolour. Usually the hay is fit to cart and stack in about fourteen days after cutting, but the best way to determine this is to pull some out of the centre of a few sheaves. If the hay is fairly brittle, it can be carted and stacked at once. It is best to place something on the ground to make a foundation for the stack. He found that a load of straw, with a border of old fencing posts answered as well as anything. He favoured round ends to stacks, as they made it easier to build, and in every way made a better job. To start the stack, place one ring of sheaves all around, with the butts projecting about 6 in. beyond the foundations. The next ring should be placed with butts inwards, the heads reaching about to the band of the first lot. This should be continued until the first layer is complete. Then another layer should be started. Care should be taken that the outside sheaves of each layer extend a little beyond the sheaves below, so that when the wall is finished it will project outwards. When the wall is within a foot of where the eaves are to be, care must be taken that the centre of the stack is well rounded, so that the outside sheaves will always incline downwards. The last layer of sheaves before starting the roof should extend about 6 in. beyond the side. This layer requires more attention than any other part of the stack, because the weight of the roof, coming mainly on the centre of the stack, is likely to press the inner ends of this layer downwards, so that, instead of the water running off, it will be turned into the centre of the stack. He found it a good plan to get a number of mallee stakes about 2 ft. long and point them. This row of sheaves is then given a good slope outwards and the stakes used to secure them. Another good plan is to pull out a layer of sheaves about a foot below the eaves when the roof is finished. This will cause the eaves to settle down with a good slope outwards. In building the roof, place the sheaves heads outwards, as in this direction they are not so likely to slip, and can be given a good slope. Care must be taken to keep the centre well rounded up. Draw each row of sheaves in to about the band of the previous row, and continue until the top is reached. If the stack is well built, and special care given to the roof, it is not necessary to thatch stacks of sheaved hay.

SALT PATCHES.—To make these patches in the fields productive, members had found that very shallow ploughing, and, better still, no ploughing at all, was the best treatment. A light dressing of stable manure was found to be beneficial. For the hard, bare patches that occasionally occur in the paddocks Mr. Dowd found that, after spreading cocky chaff and ploughing it under, wheat grew all right on the land.

WEEDY FLAVOUR IN CREAM.—Mr. Makin reported that he thought he had traced this to a weed growing on his farm, and was advised to try to get rid of it by aerating the milk.

Brinkworth, August 5.

PRESENT.—Messrs. Russell (chair), McEwin, Everett, Heinjus, and Stott (Hon. Sec.), and two visitors.

NOXIOUS WEED.—Some discussion took place on the action of the Government in having certain plants declared as noxious weeds, and then neglecting to enforce their destruction. Members were of opinion that in this matter either the District Councils or the Government were greatly to blame, as throughout the State weeds were allowed to grow on public roads and private property practically unchecked.

Murray Bridge, August 19.

PRESENT—Messrs. Wundersitz (chair), Edwards, W. and H. Schubert, Patterson, and Lehmann (Hon. Sec.).

STANDARD BUSHEL.—The Hon. Secretary initiated a discussion on this subject. At many of the Bureau meetings it had been suggested that an equal number of farmers and members of the Chamber of Commerce should meet each year to fix the standard sample, instead of the work being done entirely by the latter body. As, however, the standard sample was arrived at by mixing all the samples of the current season's wheat bought without reduction, and determining from this what a measured bushel weighed, he could not see how it could be said that the sample was fixed by the Chamber of Commerce, or how they could get a more correct standard. The injustice to the producer lay in the system of docking wheat 1d. per bushel for each pound weight under standard, and allowing nothing extra for over-standard wheat. There were two classes of grain that failed to come up to the standard sample, viz., shrivelled or pinched wheat, and wheat that had been wetted sufficiently to cause it to swell up so that the same weight of grain occupied more space than before it was wet. The question arose: "Did this so-called bleached wheat yield less flour or flour of inferior quality to unbleached wheat?" Had the effect of wetting ever been properly tested? He did not think it had, in this State, at any rate. As to fixing a high standard, if they could get a better price for their wheat, by all means let the standard be high, and let the farmer get the benefit of the high quality of his produce. Members generally agreed with the Hon. Secretary's remarks.

Port Elliot, August 20.

PRESENT—Messrs. W. E. Hargreaves (chair), H. H. and H. B. Welch, Pannel, Wickman, Gosden, Basham, Stock, Green, Brown, and W. W. Hargreaves (Hon. Sec.).

CO-OPERATION.—Paper read at previous meeting by Mr. J. Nosworthy was discussed. Members were agreed that co-operative companies were very good in principle, but the difficulty lay in getting the members to remain loyal to their own company if they could get a penny more for their produce elsewhere.

SELLING CATTLE BY LIVE WEIGHT.—Mr. Hargreaves's paper on this subject was also discussed. Members were agreed in the main that selling cattle by live weight would give the stock raiser a better chance of getting full value for his animals, but it was thought it would not pay to have a weighbridge in each small saleyard.

TIMBER AND HEDGES.—Mr. H. B. Welch read a paper on planting trees and hedges. Thirty years ago one could travel in the North for many miles and scarcely see a tree; but, thanks to the advocacy of certain people and the assistance of the Forest Department, things were different now. In the Middle North, which was formerly nearly destitute of trees, many homesteads were now almost hidden from view by the timber. The various forest plantations at Wirrabara and Bundaleer were splendid object lessons, not only of the possibility of timber growing, but also in showing how the different classes stood the climate and soil in different locations—a most important point to any one who intends to plant trees. Even as far north as Port Augusta the pepper tree and the tamarisk did very well, and in some parts the sugar gum also, notwithstanding the natural drawbacks and hardships experienced. In deciding what to plant, where possible something that will have a commercial value later on, either for timber, fruit, bark, or for firewood, should be selected. For planting close to the sea coast they must select hardy trees that will not be cut by the cold, bleak winds experienced. In and around Port Elliot and Victor Harbour they had a number of examples to aid them in selecting the kinds of trees suitable for the locality. Some varieties of pines are much hardier than others. The Aleppo pine and Cypress pine (?) were recommended by some. There was also no question of the hardness of the Norfolk Island pine—[also the Maritime pine.—Ed.]—close to the sea. The olive is also hardy, but the main objection to it is that it is of very slow growth. A few clumps of the native sheoak can also be re-

commended as ornamental and of economic value. The Moreton Bay fig makes splendid shelter, and if planted along the railway line between Port Elliot and Goolwa would greatly improve the look of the country. A mile or two back from the sea the broad-leaf wattle should have attention, as there was every prospect of wattle planting proving a profitable investment. Some of the poorer scrubland in the neighbourhood might be devoted with advantage to wattles. The *lagunaria* will withstand sea-breezes, and can be recommended for planting, for ornament, and for shelter; they are, however, somewhat slow of growth. He would advise fencing off corners in their paddocks for planting if they did not care to put trees along the boundary fences. Pines, sheoaks, and sugar gums should be planted in clumps; near the sea a breakwind of Port Lincoln wattle should be planted on the south and west sides, or where scrub is plentiful, as near Goolwa, it may be used instead. With respect to hedges, he thought the Port Lincoln wattle stood first, as the clippings were not injurious, and cattle do not eat it as they do some other hedge plants; in addition, this wattle was not likely to become a noxious weed. Next, he would place the tree-lucerne or *tagosaste*, which, however, will need to be protected against stock. Like the Port Lincoln wattle it affords but little harbor to rabbits, and is not likely to become a nuisance. He was afraid, however, that the tree-lucerne would not last for many years. [Why not?—Ed.] Box-thorn was a good hedge, but the clippings are objectionable, and as the birds carry the fruit away seedlings would probably spring up all over the paddocks. The olive was too slow in its growth, but makes a good, lasting hedge. Sweet briar, gorse, prickly acacia, and prickly pear have not much to recommend them. Members generally agreed with Mr. Welch that it would pay to plant trees and hedges, not only for shelter, but also to beautify the landscape. They thought that on leased land the owners should encourage their tenants to plant trees and hedges.

Saddleworth, August 19.

PRESENT—Messrs. Frost (chair), Benger, Hannaford, Eckermann, Klau, and Coleman (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Mr. G. Benger read a short paper on this subject. He favoured a fixed standard of 62 lb., and moved:—"That, under further consideration, this Branch considers that a fixed standard of 62 lb. was preferable to one of 60 lb., and that wheat under the standard should be docked 1d. per bushel for each pound under weight." This was carried unanimously.

POWER ON THE FARM.—Mr. F. Coleman read a paper on this subject. Wheatgrowing alone was not likely to afford as reliable and satisfactory a source of living in the future as one could wish, there being rather too many engaged in the business throughout the world, and with the opening up of virgin lands in Siberia and the Americas the future for the South Australian wheatgrower is not a very bright one. The time was coming, if it had not already come, when the farmer in reliable districts, such as this, must look for further revenue beyond his yearly wheat cheque. He should aim to dispose of his produce by the pound weight rather than by the ton; to consume on the place his hay and a large proportion of his grain crops, selling the result in the form of dairy produce, live stock, or wool. By this a larger number of hands will receive regular employment on the farm than is the case at present, when extra hands are employed at shearing and harvest time only. This will mean more intense cultivation, if those words can be used in connection with Australian farming. In Europe the average area of farm holdings is:—In France, 15½ acres; in Germany, 21½; Holland, 27; Denmark, 31 acres; in Germany over 75 per cent. of the farms are under 12 acres. Here they had a splendid climate and a good soil, but lack a reliable rainfall. Irrigation would seem to be a necessity in order that this State might carry a much larger rural population. But could not they use the produce now grown more profitably on the place? He thought they could, and to do so needed power in some form for pumping, chaffcutting, silage-cutting, grinding, rootpulp, cutting firewood, and perhaps turning the separator and threshing machine. Horseworks were the commonest form of power on the farm. Tread power, used occasionally for turning a winnowing machine and elevator, is more popular in America than here. Bulls can be trained to work these with success. The under-foot circular tread, or ordinary horse-

works, is the most popular power for chaffcutting, etc. Perhaps the greatest objection to this power is the difficulty of maintaining an even rate of speed. The driver becomes inattentive, the horses lag, he starts, walks along with the horses, or, with a sharp crack of the whip, or shout of "Get up, there," causes the horse nearest to push forward with a start, extra strain comes on the gearing, right through from crown wheel to cutter, and cogs are broken, the belt comes off, or bad work results. A steady man, walking the course in an opposite direction to the horses, meets the horses quietly twice in a round, they are not startled, and work steadier. On a wet day the work is uncomfortable, to say the least, for the horses, and on fine days the teams work at the plough or in the paddock. Water power, while steady and reliable, was practically unobtainable in this State. In the wind they had a source of power that had great possibilities. Its one drawback at present, almost sufficient to disqualify it altogether as a general purpose power, is its unreliability. He had used wind power for chaffcutting, grinding corn, and turning a grindstone, beside pumping. In a steady breeze results were satisfactory with a mill that is sensitively self-regulating as to speed. The wind blows for hardly five seconds with the same force, and the mill has to transfer that force to a fairly regular motion of the shafting and driving pulley. Most geared mills, especially the American pattern, will do that; but the liability of total failure of wind at times is the chief drawback to this power, that would otherwise be cheapest. For pumping purposes this unreliability is not a serious fault, for a storage tank or reservoir will provide water during days of calm. He was hopeful that before long a cheap yet efficient method of storing electric power might be devised. Then the practical claims of the wind as a cheap power to drive the dynamos will be evident. During the last ten years the use of the oil engine as a motive power had claimed attention. These engines are simple, economical, and reliable, with the great advantage of maintaining an even speed. No attendance is needed after starting, and there is no danger. The cost is small, under one pint per hour per horsepower, and the engines provide effective motive power for the farm for chaffing, sawing, grinding, or any other purpose for which power may be wanted. Much has been said in the past about cutting the wheat crop, or a portion of it, while in the dough stage, stooking it to ripen, then threshing out the grain and using the straw. The fact that no threshing machine at a moderate price was available may have been one reason why such a practice was not adopted. With a power such as an oil engine, and with a little adaptation to the combined harvester, such threshing might be done at a price that would pay, and so avoid the risk of loss if left for the stripper. In the Ivel agricultural motor they had another adaptation of motor power to farm work. This motor is capable of hauling ploughs, binders, strippers, or any implement used in cultivation, and in addition, by the turn of a lever, may be transferred into a stationary engine, suitable for all work, the belt pulley being driven direct from the engine. It is probable that alcohol in one form or another may become even a cheaper source of motive power than kerosine. If potato spirit proves satisfactory, as there seems no doubt it will, there may arise a great demand for potatoes, and a fresh impetus given to potato-growing.

Davenport, August 11.

PRESENT—Messrs. Trembath (chair), Hewitson, McDonald, Pybus, Roberts, Hodshon, Holdsworth, and Lecky (Hon. Sec.).

HORSESHOEING.—Mr. J. E. Lecky read a paper on this subject. To be a practised farrier requires a thorough knowledge of all the parts which constitute a horse's hoof, their functions, and the best way to protect them from injury. Much has been written about shoeing, but the man who follows Nature as near as possible will be the most successful. In preparing the foot, no hard-and-fast rule can be laid down with reference to rasping down and paring, because some horses have strong feet and high heels, while others never require a rasp on the heels from one year's end to another. The same applies as to the length of the heels of the shoe. A flat-footed horse requires more protection to the heels than one with a strong, well-shaped foot. A perfect foot should be nearly round, with a thick crust or wall, clearly defined bars, which act as extra stays to prevent contraction of the foot; well developed

frog, which protects the delicate machinery underneath, as well as acting as a cushion to the foot, being of a more flexible nature than the rest of the foot. With a foot like this, rasp the wall down level, remove any loose or rotten stuff from the outer sole, leave the frog severely alone, as it peels off itself when the new frog underneath is sufficiently developed. The bars should not be removed unless there are corns between them and the outer crust. Leave the wall of the foot a uniform thickness all round, it being a mistake to rasp the wall of the foot thinner in front than other parts. Some people think this prevents stumbling, but it will aggravate it, because the natural protection against rough or uneven roads is weakened. Having prepared the foot, make the shoe to fit it, so that there will be nothing to rasp off the outside. Spring the heels a little; nail on and clinch down, but do not put a rasp on the foot above the nails, as it will destroy the natural polish or enamel of the foot. The weight of the shoe will depend on the work the horse has to do. This applies also to the number of nails required. Five is enough for a light shoe, and seven for draught work. A writer in the *July Journal* states he can see no improvement in shoeing from thirty years ago, but he did not agree with him. Many years ago the general method was to pare down till the sole would yield to the pressure of the thumb, scoop out the bars, pare down the frogs till the blood was nearly visible, and rasp the outside of the hoof up to the hair. The results were contracted feet, sand cracks, and feet riddled with holes, and difficult to get a sound nail hold. This would not be tolerated to-day. Many men had given careful thought as to how the jarring of the shod hoof could be lessened. Some had tried to introduce a shoe without nails, but they had not been very successful. The Goodenough shoe, for instance, was to be placed on the inside of the wall of the foot: a gouge was used instead of a knife to prepare the foot, but the idea was that the wall of the foot and the shoe should be level; but the fatal objection to its general use was that a horse with worn feet would have to be turned out till the wall of his feet grew sufficiently to shoe him. A Frenchman tried a composition, which he placed inside the foot, to prevent wear, and take the place of iron. This was a failure, because it excluded the air from the foot. Then the nailless shoe was introduced during the Franco-Prussian war, also the shoe with the rubber placed in casing for tramcar horses, all of which have been discarded as far as general use is concerned. He had not dealt with horses' feet that had to be specially shod for some defect, such as seedy toe, pumiced feet, ringbones, stumbling, sand cracks, cutting, forging, or, as some people call it, clicking, because it would only interest experts. The vexed question whether a shoe should be fitted hot or cold is often discussed. His opinion was that a shoe black hot, to show when they had a level bearing, was not injurious to the foot. To illustrate his remarks, Mr. Lecky showed a shed frog and samples of the different shoes referred to in the paper: also a new clincher and hoof-parer, hammer, and toe knife for restive horses, and other implements. A hearty vote of thanks was accorded to Mr. Lecky for his very interesting paper.

Port Germein, July 30.

PRESENT—Messrs. Stone (chair), Blesing, Kingcome, Head, Thomas, McHugh, Holman, and Basford (Hon. Sec.).

GRISTING MILL.—Particulars concerning cost of a gristing plant were tabled, and considerable discussion ensued. Members were of opinion that a mill at Port Germein would pay good interest on the capital required to erect one. It was decided to approach some of the principal firms on the subject.

ORANGE SCALE.—Mr. McHugh tabled branch of orange tree covered with a black, sooty disease. [The leaves were attacked by the ordinary brown scale, which can be destroyed by spraying with kerosine emulsion or resin wash. The sooty fungus lives on the exudation of the scale insects, and will disappear if the insects are destroyed.—Ed.]

BLACK RUST.—Mr. Holman wished to know whether formalin pickling was a preventive of black rust. [As stated in April issue, page 500, formalin is recommended as a preventive of the so-called "black rust," but farmers will need to test this for themselves.—Ed.]

Golden Grove, July 28.

PRESENT—Messrs. Madigan (chair), McPharlin, Angove, Maughan, Haines, Buder, N. J. and A. D. N. Robertson (Hon. Sec.).

ANNUAL REPORT.—Eleven ordinary meetings held, with an average attendance of 9.5 members. A special meeting took the form of a visit to Roseworthy Agricultural College. Four papers have been read and discussed. Messrs. T. C. Angove and A. D. N. Robertson were elected Chairman and Hon. Secretary respectively.

BUDDING AND PRUNING ORANGE TREES.—Some discussion took place on the best time to perform these operations. Mr. Haines thought November the best month for budding, and December and January for pruning. Other members favoured pruning in August. [The Horticultural Instructor states that the time to insert buds will depend upon two factors—the condition of the trees and the weather. Buds may be inserted at any time when the bark will lift freely and suitable wood for budding can be obtained, provided the weather is warm. Pruning should be done just as the trees are starting to make new growth. Where large branches are to be removed, September is usually a suitable time. Ordinary pruning may be undertaken now or about March.—ED.]

Mount Gambier, August 20.

PRESENT—Messrs. Edwards (chair), Watson, Barrows, Wilson, Kennedy, Clarke, Norman, Wedd, Bodey, Williams, Schlefel, Ruwoldt, Mitchell, and Collins (Hon. Sec.).

SPRAYING FOR CODLIN MOTH.—Mr. Watson reported that last season he sprayed his apple trees with arsenite of soda for codlin moth, with very successful results. He believed had he given two more sprayings he would have had scarcely any fruit affected. As it was, quite 90 per cent. of the fruit was clean. Mr. Norman reported that his codlin moth traps had proved very successful, having less infested fruit than during the previous season on the trees where the traps were used.

BEEF MEASLES.—In reply to question, Mr. Williams explained the cause of this disease. He also referred to the necessity for providing pigs with a good clean run, and thought this particularly applied to the South-East.

BRANDS ACT.—A copy of the proposed amending Act was tabled, and some discussion on the registration of earmarks and the waybilling of travelling stock ensued. Mr. W. J. T. Clarke was asked to look through the Bill and report on points of interest at next meeting.

FOX DESTRUCTION.—Considerable discussion on this subject took place. It was stated that some of the District Councils were paying for fox scalps, while others were not, the result being that an unfair burden was placed on the ratepayers in the former districts. It was resolved that this Branch favours the repeal of the Act at an early date, on the ground that it was useless and totally unworkable in this district.

Inkerman, August 23.

PRESENT—Messrs. Kennedy (chair), C. H. and C. E. Daniel, Mugford, Williams, Lomman, Board, Fraser, and Smart (Hon. Sec.), and one visitor.

IMPROVEMENT OF STOCK.—It was resolved that the Branch desires to place on record its appreciation of the action of members and others in introducing high-class stock into the district. Reference was specially made to recent purchases of high-class draught stallions and brood mares. In cattle, sheep, pigs, and poultry the district could show high-quality stock.

SELLING CATTLE BY LIVE WEIGHT.—A short discussion on paper read at Port Elliot Branch took place. Members generally were opposed to the proposal to sell cattle by live weight.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from July 28 to August 29, 1904.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	47	97	186
Carpenters	1	—	2
Masons and bricklayers	2	1	1
Painters	2	2	1
Fitters and turners	3	1	3
Enginedrivers and firemen	—	3	—
Boilermakers and assistants	2	3	12
Blacksmiths and strikers	2	—	3
Ironmoulders	3	—	2
Trimmers	1	—	—
Electrical wireman	—	—	1
Woodturner	1	—	—
Cooper	1	—	—
Pipejointer	—	—	1
Apprentices	19	2	4
Cleaners	2	3	—
Porters and junior porters	6	4	1
Rivet boys	3	—	—
Totals	95	116	217

August 30, 1904.

A. RICHARDSON, Bureau Clerk.



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VOL. VIII.

THE LATE MR. F. E. H. W. KRICHAUFF.

The news of the death of the late Mr. F. E. H. W. Krichauff, which occurred on the morning of Thursday, September 29, will be received with feelings of deep regret by the members of the Agricultural Bureau and by cultivators of the soil generally in South Australia.

Mr. Krichauff was born at Schleswig, Germany, on December 18, 1824, and had, therefore, reached within a few months of the age of eighty years. Mr. Krichauff early devoted himself to scientific agriculture, and before he left Germany for South Australia, in 1848, had graduated at the University of Kiel, and had also won his diploma in horticulture and floriculture. On his arrival in South Australia he settled on a section of land near Bugle Ranges. In 1854 he entered public life as a member of the first Macclesfield District Council, and since then he had occupied many public positions, sitting as a member of Parliament for a number of years, first in the House of Assembly and later in the Legislative Council.

In his Parliamentary life Mr. Krichauff will be best remembered for his work in assisting the late Sir R. R. Torrens to secure the passing of the Real Property Act, of which South Australia is so justly proud; and of his advocacy of forest conservation. In 1870 Mr. Krichauff secured Parliamentary sanction to his proposal to encourage forest planting by granting land orders to the value of £2 per acre to persons planting not less than five acres of trees. The direct result of this was the planting of many hundreds of acres to forest trees. Soon after he went a step further, and introduced a Bill to secure the reservation of land in various parts as State forests and the appointment of a Forest Board. The present Forest Department is the result of this work.

Soon after Mr. Krichauff started farming operations his scientific knowledge was recognised and valued by his neighbours, and he has ever been ready to help others to improve their cultural operations. As a writer on agricultural matters his name is a household word in South Australia. When the Central Agricultural Bureau was established by the Government in 1888 Mr. Krichauff was appointed a member, and at their first meeting his fellow-members recognised his abilities by appointing him Chairman, a position he held until June, 1902, when the Central Agricultural Bureau was merged into the Council of Agriculture. As Chairman of the Central Bureau he shares with Mr. Molineux most of the credit for the success achieved by that organisation. From the first he was a strong advocate for improvement in our methods of cultivation and in the use of manures. Two years ago, at the Annual Congress of the Bureau, Mr. Krichauff was presented with a handsome testimonial recording the appreciation of the members of the Bureau of the valuable services he had rendered to the producers. Mr. Krichauff was also an early and strong supporter of the Roseworthy Agricultural College, and for several years was a member of the College Council. When the Council of Agriculture was established two years ago, Mr. Krichauff was appointed a life member of that body, and it is a matter for deep regret that his association with it has been so short-lived. In the death of Mr. Krichauff the agricultural industry has lost a good friend. To his sorrowing family the heartfelt sympathies of the members of the Agricultural Bureau are respectfully tendered.

NOTES ON SOUTH AUSTRALIAN MILLING WHEATS.

By M. KAHLBAUM.

At the commencement of this article, in order to avoid any possible misunderstanding, I wish to impress upon my readers that my observations are of a purely individual character, and that I do not pretend to express the views and opinions of the South Australian milling fraternity. On the contrary, I am persuaded that on some points millers hold different opinions. The standpoint I take is viewed from the export miller's part, and as such I wish to treat my subject. There seems to be a widespread misconception as to the South Australian milling industry. A favourite and carefully nursed idea is to the effect that South Australian wheat and flour are unsurpassed in quality; an idea which dates back to the days when the splendid Lammas, Tuscan, Golden Drop, and Purple Straw wheats supplied millers with raw material which was unsurpassed for quality.

Things, however, have altered since then, and, I regret to state, not to the advantage of the South Australian milling industry. Victoria, New South Wales, also Queensland, once South Australia's best customers for flour, have built up large and influential industries of their own. It was reasonable to speak of the Lammas, Tuscan and other varieties previously mentioned as good milling wheats, as the flour made from them commanded the highest possible value in the then accessible markets. Why, then, does not South Australian wheat occupy the same proud position which it commanded in the past? Has the quality of our wheat deteriorated, or what factors have been at work to have brought about present conditions? Generally speaking I do not think the quality of the wheat has deteriorated. Though of the old varieties of the Lammas and Tuscan types very few are now cultivated, I am of opinion that the average present-day sample of South Australian wheat constitutes very fair raw material for the manufacture of flour. The conditions which in former days gave South Australian raw material a predominating value over other wheats in the world's markets have changed. By the opening up of the vast, fertile regions of the United States, Canada, Southern Russia, and the Argentine Republic, British and Continental millers became possessed of raw material which they value higher than South Australian, and which wheats we, therefore, must term very good milling wheats. As the intrinsic value of any commercial commodity is measured by the price that it will realise, we are compelled to assign to certain grades of Canadian, American, and South Russian wheat the palm for highest value.

The next question that presents itself is: "What is the reason for those wheats commanding a higher value than South Australian in the world's markets?" Simply because the monetary value of the manufactured produce—flour—is higher than a similar article manufactured from our wheat. The flour is known as "strong flour," the quality of which is characterised by a high percentage of flesh-forming matter, good colour, and great strength—the three main points which constitute the flour value from a commercial point of view. The wheats from which these flours are produced belong to the Fife, Bluestem, and Defiance families, which are not grown to any extent in Australia. The grains of these varieties are of a red, hard character, medium, even small in size, whereas the South Australian wheats are represented by white, mellow grain of large size and most prepossessing appearance. For various reasons, best known to the agriculturist, most of the older South Australian varieties have slowly gone out of cultivation, and other, but certainly not superior, types from a milling point of view have taken their places. After the so-called "North" was settled by the farmers it became obvious that early varieties were the most likely to succeed, and that the late varieties were too susceptible to injury by the dry winds and lack of moisture during the spring and early summer months. Various local selections were placed upon the market at different times, and of these one of the most important was Ward's Prolific, which came into favour about 1885. Readers may think it strange for me to refer to Ward's Prolific as the most important of all South Australian wheats. Perhaps if I modify it to the most interesting variety it may meet the case more correctly. I shall mention later on why I hold this view. Another, and the most important factor in the changing of wheats grown here has been the red rust, which has caused losses to the Australian wheatgrower which are well-nigh incalculable. Mr. McAlpine, the Victorian Pathologist, calculated that the damage in 1889 alone amounted to two million pounds sterling. I daresay South

Australia's share in that figure amounted to about a third. The rust problem was a means of bringing many new varieties to the fore, and of these Ward's Prolific was one. As to its rust resistance there can be no doubt; but as a wheat for general cultivation it was never in great favour, and as a milling wheat the trade never appreciated it. However, as a parent of a number of valuable and largely cultivated wheats, Ward's Prolific holds first place. Whether South Australian climatic and soil conditions are so eminently suitable to natural cross-fertilisation, or whether Ward's Prolific displays an eminent capacity for sporting, I am unable to state. The fact remains that Budd's Early, Baroota Wonder, Carmichael's Eclipse, Robin's R.R., Golden Prolific, Ward's White, Pratt's Pearl, Phyllis's Marvel (or, more correctly, Marshall's No. 4), Marshall's No. 3, Silver King, and other varieties are all offsprings from Ward's Prolific. There is no variety of wheat which, within the last few years, has claimed greater favour within the Commonwealth and New Zealand than Marshall's No. 3. Numerous other wheats, mainly local selections, have found favour in various districts, some of which have proved failures. In the estimation of millers, none of these wheats have exhibited special flour qualities. In the past, the aim of the agriculturist has been concentrated on the desire to obtain prolific sorts, irrespective of their milling value, which was considered of secondary importance. Neglect of this point has, however, in many instances resulted in financial loss to the grower. Many red varieties of wheat which have given fairly satisfactory results to the grower so far as yield alone was concerned, when marketed have been objected to by the millers, who refused to touch them, and by the grain dealers, who could not handle them for fear of loss.

In the British and foreign markets South Australian wheats are known and bought as white, dry, plump, and fairly heavy grains, of mellow, milling character, and command as such a certain price in the international grain scale. Any departure from this type creates difficulties which ultimately reflect upon the producer. This is the reason that the introduction of red wheats into South Australia has proved a failure. I do not hesitate to state that the "rust problem" has been the main cause of slowly changing the established character of South Australian wheats. From so-called "white wheats" of former days they have changed to a decided amber colour. The Ward's Prolific strain permeates all, or at least most of our crops. The average milling value has certainly not improved, as varieties of the Steinwedel, King's Early, and similar character exhibit most objectionable features in the manufacture of flour. It is, therefore, imperative that the changing of the raw material for the production of flour must be in the direction of improving on the good qualities of recognised South Australian varieties. There arises, then, the question whether it is possible and profitable to do this. We have seen that continuous changes have been going on for years, and that these changes have taken the shape of improvement from the farmers' point of view. The milling industry of South Australia is every year by force of circumstances becoming more an export industry, which has to face notably the American competition in the markets of the world. As such, the industry must be able to draw on the best possible raw material which South Australia can produce. And, since the agriculturist found it possible in the past to increase the value of his crops by cultivating varieties which accommodated themselves to special conditions, experience points to the possibility of combining profitable yields with greatly increased strength of flour and higher milling value; in short, the production of high-class milling wheats.

Considering the question: "What are the qualities which constitute high-class milling wheat?" we have to view it:—(1) from the farmer's, (2) from the miller's, (3) from the baker's, and lastly, from the consumer's point of view. To the farmer, the miller, and the baker the wheat which produces the largest cash value is the best. The consumer demands as the final product a loaf of bread which is light, of good colour, well fermented, easily digested, and whose nutritive value is of the highest possible degree. The hard red wheats of Canada, Minnesota, and South Russia seem to most closely conform to the demands of the baker and consumer, and, therefore, command the proportionate higher value in the world's markets. The question whether those hard red wheats can be made a commercial success in South Australia must be replied to in the negative. Experience has conclusively demonstrated the futility of obtaining satisfactory results from the cultivation of Fife, Blue Stem, and Defiance wheats north of Adelaide. Mistakes which have been made in the past in the cultivation of new varieties should be avoided in the future.

It would be more satisfactory to have to deal with fewer varieties of acknowledged value than grow almost countless numbers of wheats which do not conform to local requirements. Many failures are attributable to the haphazard system in the selection of varieties. Climatic and soil conditions demand special varieties for special districts, and any departure from this recognised law must end in failure. I do not think it out of place to couple Mr. Marshall's name here with the splendid results achieved so far in the improvement of South Australian wheats. Much as has been gained, much more has to be done to bring South Australian wheat to the top of the scale. We possess the means for carrying on experiments in the Roseworthy College, and in the Agricultural Bureau the agents to put to practical test the results of the College work. There is no reason whatever why the goal should not be reached, though the progress of the work naturally must be slow, as there is but one harvest every year.

A short *résumé* of what has been done in South Australia already in order to solve the problem of strong flour wheats may be of interest. Mr. W. Farrer, Wheat Experimentalist of the New South Wales Government, carries on experiments on a large scale, and, through his kindness, dozens of new varieties found their way into the hands of a few South Australian farmers, who cultivated the most promising sorts with a fair amount of success. Rerraf, described by Mr. McAlpine, of Victoria, as the best rust-resister in existence, claims consideration. Comeback, Jonathan, Bobs, and John Brown are representatives of the so-called strong flour varieties, and the two first-named sorts will be tested in various parts this year on a fairly large scale. Mr. Farrer, recognising years ago the possibilities of Australian wheat production, set himself the task of making wheats which were to combine all the qualities of an ideal bread cereal. The wheats he aimed at making should conform to the demands of farmer, miller, baker, and consumer. And, with this point in view, he produced his so-called Five-Indian wheats, varieties suitable to Australian conditions—prolific, earlier than the average Australian sorts, plump, white grain, combined with strong straw, possessing the quality of rust-resistance, and producing flour of the highest commercial value. According to actual tests carried on for the last six years in South Australia, Comeback seems to represent a very fair member of this Five-Indian family. To my belief, it is the best we have so far secured. As to Jonathan, Bobs, and John Brown, it is too early to form any definite opinion.

I do not wish to imply that these Five-Indians are the *ne plus ultra* of milling wheats. Far from it. My intention in referring to them is solely to show what may be achieved by systematic cross-breeding and selection. It has been suggested in many quarters that those attempts to improve the nutritive value of Australian wheats were what we commonly term fads; and if it really were possible to raise such wheats, the farmer would not benefit financially by their cultivation. The only one to gain would be the baker, by selling water for bread. I do not think that such arguments are logical, for, I may be permitted to repeat again, the value of a commercial commodity is measured by the price it will fetch in the world's markets; and, if that commodity commands a higher price in the world's markets, this must eventually reflect upon the raw material. Every farmer knows that the values for Australian wheats in average seasons are made in London, and since the British miller sees fit to pay for best Canadian wheat 34s. per quarter, and for best Australian 30s. 6d., surely he does not do so for philanthropic reasons in favour of Canada. I have heard it said in other quarters that the old-established Australian varieties were good enough for any white man to eat. Millers should produce more wholesome flour and not trouble so much about the dazzling white colour. As to what is meant by wholesome opinions are very much at variance. That the Americans at present even go as far as to bleach flour as you may bleach linen may come as a surprise to many who consider the white flours as a passing fancy. In regard to such criticisms, the fact is lost sight of that South Australian agriculture has entered on a new phase. The advent of fertilisers and seeddrills has completely revolutionised the aspect of the industry; the possibilities of rust-resisting wheats have demonstrated the very tangible results from its cultivation. It is not many years since these factors were termed fads—passing fancies. Wherever we look in the farming industry we see the desire to improve. Horses, cattle, sheep, pigs, poultry, all are subjected to the same law. By careful cross-breeding and selection you are trying to raise the intrinsic value of your stock. And if you sell your crossbred lambs at 16s. per head, you

do not feel inclined to call it a fad of the butcher, who, with the consumer, is supposed to reap the benefit of the transaction. If the trade demand a commodity and is inclined to pay for it, try your hardest to supply it. The producer will not be the worse for it as regards his pocket.

Reviewing the situation further, this tendency of improving the milling qualities of wheat has led to the establishment of experimental stations in many countries. Leading in Australia is New South Wales, where Messrs. W. Farrer, Dr. Cobb, and Mr. Guthrie are fostering the movement. Canada and the United States are already reaping the rewards of similar work. Hungary and Prussia have also taken up this matter. The Association of British and Irish millers are experimenting on the problem, aided by a grant from the British Government. In their report they say:—"The problem is: How to combine increased strength with those high yields per acre which place the United Kingdom in this respect at the head of all wheat-growing countries. Your committee has throughout maintained that strong flour wheats can be grown in England. The last season's work has further confirmed in the most ample manner this view, and points most encouragingly to the possibility of a combination of large yields with greatly increased strength." This Association is composed of as sane, level-headed, and successful business men as there are to be found anywhere in the world. I maintain that South Australian conditions offer very favourable opportunities for working on this problem, as the ground is prepared by the work of Mr. Farrer and others. This is not a mere fad, but a most serious problem, which deserves the attention of the agricultural community in South Australia.

FALLOWING IN SOUTH AUSTRALIA.

By W. L. SUMMERS.

The following tables will be found of considerable interest, showing, as they do, the progress made in the different statistical districts in the practice of fallowing the land preparatory to the cereal crop. The term cereal crop includes wheat, oats, and barley, for both grain and hay:—

CENTRAL DISTRICT.

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total area under cereals ...	690,160	718,622	735,925	801,506	761,689	792,390
Area of land under fallow ...	168,720	169,214	232,681	302,413	331,513	362,232
Percentage of fallow to area of cereal crop ...	24.4	23.5	31.6	37.7	43.5	45.7

In considering these figures it will, of course, be understood that the fallow of one year is included in the next season's wheat crop; but, for purpose of comparison, the percentages are shown for the years in which the statistics are gathered. The year 1890 is taken as a starting point, then 1896, and each alternate year since are included in these tables.

It will be seen that in the Central District during the seven years, 1890-96, no advance was made in the area of fallow: but since then the advance has been steady and rapid, the percentage of fallow nearly doubling itself in the seven years.

LOWER NORTH DISTRICT.

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total area under cereals ...	759,518	646,313	623,571	651,346	634,540	648,178
Area of land under fallow ...	203,724	180,000	254,734	318,122	343,178	373,413
Percentage of fallow to area of cereal crop ...	26.8	29.2	40.8	47.3	54.1	57.6

Here, again, it will be noticed that while the advance in the seven years, 1890-96, was very slight, the proportion has been just about doubled in the last seven years. The Lower North shows a considerably larger percentage of fallow than the Central District. To every 100 acres under cereal crop the Lower North has 57.6 acres of fallow, and the Central District 45.7 acres. The greater rainfall renders fallowing less imperative in the latter district.

UPPER NORTH DISTRICT.

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total area under cereals ...	512,645	581,065	571,612	592,065	499,473	436,283
Area of land under fallow ...	151,740	155,455	231,138	245,720	184,152	238,382
Percentage of fallow to area of cereal crop ...	29.6	26.7	40.4	41.5	36.8	54.6

These figures bear a close relation to those of the Lower North, except in regard to the year 1902. The reduction in the area of fallow land then was doubtless due to the drought. Not only was much of the land sown the previous year practically fallow, but in many instances lack of fodder for stock did not permit of the land being fallowed in that year. The percentage of fallow in 1903 is considerably better than that shown in the Central District.

SOUTH-EASTERN DISTRICT.

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total area under cereals ...	42,298	45,684	71,614	64,581	69,873	91,651
Area of land under fallow ...	2,975	2,215	1,597	2,168	3,017	4,547
Percentage of fallow to area of cereal crop ...	7	4.8	2.2	3.3	4.3	4.9

At the South-Eastern Conference held at Bordertown in March, 1904, one gentleman stated that they did not know what fallow was in the South-East, and the above table scarcely disproves that statement. The greater average rainfall and the variety of crops grown are, no doubt, largely responsible for the small area of bare fallow, and no one will deny that holders of land in the district are fortunately situated if they can grow good cereal crops without resorting to bare fallow. There is, however, little doubt that over a considerable portion of the area represented by the term "South-Eastern District" fallowing might be practised with profit. The marked variation in the land under cereal crop in the different years is, no doubt, due to the fact that holders of large estates let portions of their properties on the share system for a year or two, and then allow the land to go back to pasture.

WESTERN DISTRICT.

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total area under cereals ...	41,049	115,317	145,226	188,419	178,845	179,079
Area of land under fallow ...	6,993	5,677	14,460	19,117	27,086	31,566
Percentage of fallow to area of cereal crop ...	17	4.9	9.9	10.1	15.1	17.6

This table shows that the Western District farmers to a large extent neglected fallowing for several years, and have now only reached the percentage attained fourteen years ago, though the area under fallow is nearly five times as great.

The following figures show the total area under cereal crop, and the total area of fallow land in the State during the years mentioned:—

—	1890.	1896.	1898.	1900.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Area under cereal crop ...	2,045,670	2,107,001	2,147,948	2,297,917	2,144,420	2,147,581
Area under fallow	534,152	512,561	734,610	822,013	888,946	1,010,141

As will be seen, while the area of land under cereal crop was in 1903 101,911 acres greater than in 1890, the area of fallowed land had increased to the extent of 475,989 acres. It may also be noted that practically 50 per cent of the land now under crop was fallowed in 1903.

DISPOSAL OF SURPLUS POULTRY.

FATTENING FOR TABLE PURPOSES.

Written for *The Journal of Agriculture*.

By D. F. LAURIE.

Many people are at a loss to know how to deal with their surplus birds to the best advantage. The breeder of high-class stock, as a rule, has a good market, and if he has good birds of the popular varieties need only make the matter known in order to make sales. Those who are breeding on a large scale often have numbers of birds which are faulty, and which they prefer not to sell as stock birds, even at a low price, rightly considering that in the long run such a practice is detrimental to the good name of their strains. Those who breed for egg production often have pullets which they have reason to discard, and also cockerels in excess of demand as stud birds. The breeder who keeps a few birds as a hobby may have a few more than he either desires or can afford to use in his kitchen. The farmer should always have surplus young stock which he wishes to sell in such condition as to prove profitable and secure further business from those to whom he sells.

Where the birds are limited in number the requirements in all the above cases can be met in a similar manner. I may at once say that the average common scrub fowls I used to see, with few exceptions, a few years ago when visiting country districts, are not worth bothering about, and I hope in these days of improved methods a better class of bird will be kept. Birds which through lack of method in breeding are rapidly reverting to an old type, almost bordering on the jungle fowl, from which modern breeds are descended, cannot be expected to give good returns. Birds lacking constitution are poor doers, and will not fatten, however well fed. Birds running at large rarely, if ever, get fat enough to make presentable market fowls. If they have a good range deficient in natural food they run all the flesh off their bodies. If there is plenty of natural food (seeds, insects, etc.), it will be found that they will leave the grain, soft food, etc., which would produce flesh, and go in search of the other more agreeable but less fattening food. For this reason we see flocks of young birds gradually getting older and older, and past the conventional age when they should be marketable, still lean as Pharaoh's kine, despite liberal feeding. The pullets generally carry more condition than the cockerels, and begin laying at a time when the cockerels of same age are still gaunt scarecrows. The conditions of well-fed birds at large are favourable to the pullet, as she carries enough condition for health and egg production.

At an average of three months of age all cockerels intended for market should be placed in fattening coops. According to the number of birds to be dealt with at a time the size and number of coops will depend. Birds when being fattened require no exercise, because exercise causes waste of tissue, which means that a certain amount of food is required to make good that waste. Quiet is also an element of success, because birds in confinement need peace and quiet to digest their food. Should they be cooped in view of

their old mates still at liberty they will fret, and even lose what little flesh they had. A cool, darkened shed is the best place. In the country, long, low sheds of straw can be made for a trifling sum, and are admirably suited. In these a double row of coops, back to back, may be placed, the open side of the shed being hung with split wheatbags, to ensure shade and subdued light. The coops may be made of rough boards, with 2 in. x 1 in. battens for the bottom, so that all droppings can fall through. The fronts may be of battens or strips of hoop-iron, so that the birds can get their heads through when feeding from the troughs in front of the coops, and in which the food is placed. If the operations are to continue I should strongly advise the use of galvanised iron, as freedom from dirt, vermin, and disease can be assured, and the cost is not very great; certainly not more than the business warrants. Have the coops uniform and convenient. Nothing is more irksome than routine work which gives unnecessary trouble. Make your shed high enough, so that you can stand up without bumping your head. Construct the doors of the coops so that they can be opened and shut with ease. Study comfort. The length of the shed and size of coops, of course, depends on the number of birds to be operated upon. A coop two feet by eighteen inches will be ample for a single bird. Have a few of these. The main coops should be large enough to hold five or six birds; but do not be too liberal with the space; the birds are none the better; they are there to fatten, not to exercise. A coop five feet long, 18 in. by 20 in., will afford ample space for half a dozen birds.

Build your shed of the size required, and give all coops a coat of hot limewash. Have everything in readiness. At night catch your birds and coop them. Have a little clean, fresh water in front of each coop, but do not give any food until the birds are really hungry. This ensures a clean start with a good appetite. Hunger tames wild birds, and the act of feeding them shows that the advent of the attendant is to be looked for with pleasure, not fear. The food troughs are in front of the coops, and may be of short lengths of galvanised guttering, with ends soldered to a rectangular piece, which supports the trough in position; or V-shaped troughs of deal may be used. *All troughs should be scalded daily to guard against germs.*

The best food is not always obtainable. One cannot lay in a stock of various sorts of food when the operations are on a small scale, because the price for small quantities is higher than for bulk, and also many foods recommended as suitable to other climates do not give such a good return here. Maize is a food much recommended of late. My advice is: Do not use it except in small quantities during very cold weather, at which time it is of service in supplying animal heat. As a true fattening food for poultry it is of no use. Unlike other foods, the fat it produces is accumulated around the internal organs, where it is of no use to the consumer, and instead of being distributed throughout the flesh tissues, where it would increase the quality of the flesh during cooking, it is accumulated in oily, yellow layers, and consists of a good deal of water, and nearly the whole is lost in cooking, and the flesh rendered dark and uninviting. The loss of weight during cooking is considerable, and the quality of flesh is inferior.

Oats, which form the staple fattening food in England, are hard to obtain of suitable quality here. Then they must be so ground that the hard, indigestible husk is reduced to powder, or, better still, they should be "hulled"; the expense of the latter, however, debars their use.

Bran and pollard, or wheat meal, bran, and pollard mixed with skim or separator milk, will give as good a result as can be wished for. Some people use sour milk, others sweet; sour is the practice in all the large establishments. It is claimed that the birds fatten better on the sour milk food. At any rate, whichever method is begun, there must be no changing from sour to sweet, and *vice versa*. In England and America the practice is to mix the food some hours before use, so that a slight fermentation may take place. Here the process begins very soon, almost at once in warm weather. For that reason I should advise mixing when wanted. A certain amount of green food should be added, to keep the system cool. Grass, lettuce, and boiled nettles are all excellent. If a bird refuses its food, and is not ready to kill, turn him on to a small run and feed sparingly on grain till he picks up again.

In about twenty-one days at the outside your birds should be fit, and weigh an average of five pounds. If plump and fit before that date, send

them on to their destination. Three weeks is about the limit for successful cooping. Some birds never put on condition, and such should be sold together. Always grade your birds according to quality. Never put a bad specimen in just to fill the crate you are sending to market. Such a bird will spoil your sale completely.

The time of feeding is of the utmost importance. Cooped birds are impatient. They should be fed twice a day, and convenient hours should be chosen, so that there may be no departure from the timetable. As early in the morning as possible, and at the same hour to the minute, and half an hour before sunset. Give as much as the birds will readily eat, but let none remain in the troughs. Some people limit the feeding time to five minutes. If the birds are to be specially prepared, add a little rendered fat to the food—half a pound per day for twenty birds, increasing gradually to half an ounce per bird. The cost of this method of fattening will be very little more than ordinary feeding, while the gain will be very great.

The ground under the coops should be carefully levelled, and then roughed up with a rake, well watered, and liberally dressed with quicklime. If the whole surface be then trowelled over with a plasterer's float, or even a flat board, a smooth surface will result, which will dry hard, so that the droppings may be daily removed.

A Canadian authority, writing on the subject, says:—"Fattening chickens is the most important part of the poultry business. No matter how well bred a chicken may be, he will not bring a good price on the market unless well fattened and properly dressed. *The farmer should never sell a lean chicken.* In fact, the time is not far distant when buyers will not take a lean chicken." The Canadians, through careful attention to breeding, housing, grading, fattening, etc., have built up a fine trade with England, a trade which is rapidly increasing and of great value. This is entirely due to the Government experimental stations and the information made available for the farmers throughout the Dominion. Blood meal, that is, evaporated blood, is much used in America in poultry foods; it is also used as a substitute for meat in fattening. In a test with 183 newly hatched chickens, weighing 15 lb., and using meal, milk, blood meal, and millet for the first two weeks, and dispensing with the millet thereafter, the total weight at sixteen weeks is given as 848 lb., or an average of 5 lb. 1 oz. per bird for the remaining 167 birds, the other 16 having presumably died. The average cost of feed for each pound gain in weight is given as 3.9 cents, or just about 2d. (twopence). The chicks, therefore, cost 10d. each at the age of sixteen weeks, and weighed 5 lb. 1 oz. each, average. Now, for the export trade, these birds could have been killed at fourteen weeks, at a cost for food of about 8d., and at a low estimate would have realised 1s. 6d. on the Adelaide market. If they were of an approved breed or cross, such birds should pay handsomely at average prices paid in England for best Australian poultry. No really prime birds have yet been sent to my knowledge. In the Canadian experiments the blood meal was used until the seventh week, after which it was discontinued. At that date the proportion was 1 lb. blood meal to 15 lb. of meal (ground hulled oats). The exact ratios were:—1 part blood meal, 15 parts meal (ground oats), 20 parts separator milk. Other rations fed to various lots of poultry in tests were:—

No. I.

Corn meal (maize)	5 parts
Shorts (pollard)	4 parts
Pearl oat dust	1 part
Animal meal (meat, fat, etc.)	1 part

No. II.

Corn meal	2 parts
Ground buckwheat	2 parts
Pearl oat dust	1 part

No. III.

Corn meal	4 parts
Ground buckwheat	2 parts
Pearl oat dust	2 parts

No. IV.

Corn meal	2 parts
Pearl oat dust	1 part

It will be noticed that maize (corn meal) figures largely in the foregoing. It is, however, realised now in Canada that for the English market birds fattened on maize, or a large proportion of maize, are unsuited, owing to the yellow tinge of flesh and accumulations of yellow fat due to the maize. Ground oats are almost exclusively used in most of the English fattening establishments. Plump Russian oats are used. Special stones are necessary in order to grind the husks to powder. A mixture of ground oats, ground barley, and maize meal, in equal parts, all finely ground, has proved very excellent. Still, as properly ground oats are not readily obtainable here, we shall have to fall back on the foods suggested earlier in this paper. There can be no doubt that if all poultry intended for market were cooped and well fed, as suggested, for a fortnight or three weeks, the age at which the surplus birds could be sold profitably, as far as buyer and seller are concerned, would be much reduced. We should see an increased local consumption, and, as the supply increased, should have a surplus worth exporting to England.

I have refrained from discussing the wisdom of fattening from either the family or commercial point of view. I need only remark that no one cares to kill, pluck, cook, and carve three birds when two should more than suffice. On an average the ordinary unfattened farm bird of three pounds weight carries six ounces of bone and 20 to 26 ounces of offal, and after the loss during cooking only about 12 ounces of edible meat remain. This is due to the fact that the frame, viscera, and other waste portions on a rough, three-pound bird are sufficient for a well-fatted bird of the same age weighing five or six pounds or more. The additional weight can be put on at a small cost, and, whether for home consumption or for sale in the market, there is no comparison between the two. If you once start fattening your own poultry you will continue, for no other will suit your palate. Even in this State, where so many people buy a fowl more often on account of its apparent cheapness than on its quality, you will soon find a steady, profitable demand for well-fatted young birds.

HORTICULTURAL AND VITICULTURAL STATISTICS.

VICTORIA AND SOUTH AUSTRALIA COMPARED.

The publication of the annual agricultural statistics in the two States permits of a short comparison of yields for 1903-4, and we believe that the figures will come as a surprise to many South Australians, who are disposed to look on Victoria as very much ahead of their own State in matters pertaining to fruitgrowing and viticulture.

The area of orchards and gardens in Victoria is given as 46,624 acres. This does not include small private gardens in townships. In the South Australian statistics the figures are split up, part being shown in acres and part accounted for by number of trees. Of gardens, there are 9,964 acres; of orchard, 18,725 acres; but the latter does not include almonds, of which we have 178,535 trees; apples, 586,217 trees; oranges, 141,856 trees; lemons, 67,882 trees; olives, 80,560 trees; or a total of 1,055,050 trees. If we allow that 100 trees represent an acre, the above number would correspond to 10,550 acres, making the total area under garden and orchard in South Australia, leaving out all small private gardens of less than one acre, of 39,239 acres, as compared with Victoria's total of 46,624 acres.

The Victorian statistics show the yields of all kinds of fruits, while those of South Australia only specify apples, almonds, oranges, lemons, and olive oil. While the former may to some appear to go into needless detail, ours err on the opposite side. The absence of these details does not permit of a comparison of yields except in the items shown below:—

	Victoria.	South Australia.
	cwts.	cwts.
Apples	251,573	116,545
Almonds	1,016	6,585
Lemons	20,842	18,100
Oranges	9,635	43,624

In dried fruits only currants and raisins are shown in the South Australian statistics. This is to be regretted, in view of the importance of the dried-

fruit industry. Those connected with the industry would welcome the addition of at least two lines, viz., "dried apricots" and "total other dried fruits." The former especially constitutes a very large proportion of our total output of dried fruits. The particulars included in the Victorian statistics are shown below, together with our production of raisins and currants:—

	Victoria. lb.	South Australia. lb.
Dried apples and pears	25,137	—
" prunes	58,293	—
" peaches and nectarines	114,096	—
" apricots	184,960	—
" figs	17,599	—
" currants	838,955	1,165,472
" raisins	5,986,060	1,463,056

It will be seen that in Victoria apricots and peaches occupy the premier places in the dried fruits output other than raisins and currants. Three-fourths of the total output probably comes from Mildura. In currants South Australia is now considerably ahead of Victoria, but the latter produces four times the weight of raisins that we do. In both Victoria and South Australia the 1903-4 output of currants more than doubled that of the previous year.

In connection with the currant and raisin industry it will be noted that the total production of currants in the two States amounts to 2,004,427 lb., while, from recently published statistics of our imports and exports, we learn that in 1903 the total quantity of currants imported into the Commonwealth and retained for home consumption was 8,548,693 lb. Notwithstanding, therefore, the fact that the local production of currants has more than doubled, we still import into the Commonwealth four times as much as we produce.

The increase in the production of currants and raisins in the two States is shown in the following table:—

Years.	Raisins.		Currants.	
	Victoria.	South Australia.	Victoria.	South Australia.
1897	1,262,912	794,864	85,523	—
1898	1,482,208	466,816	51,744	97,104
1899	2,002,648	693,280	115,696	126,896
1900	1,998,864	604,576	371,280	341,264
1901	3,289,440	912,912	416,080	291,984
1902	3,979,798	1,294,944	416,890	547,232
1903	5,986,060	1,463,056	838,955	1,165,472

In view of the low prices ruling for raisins and the quantity which the growers are compelled to export, it is surprising to note the comparatively large quantities still imported into the Commonwealth. Last year the net total imports were 1,102,920 lb., whereas exports of local production amounted to 555,176 lb.

The following table gives the area under vines and the quantity of wine made in the two States in 1903:—

VINES AND WINES.

	Victoria.	South Australia.
Acreage in bearing	25,657	18,847
Acreage not in bearing	2,856	3,770
Total acreage under vines	28,513	22,617
Gallons of wine made	2,551,150	2,553,050

The agricultural statistics of South Australia do not include the wine made by purchasers of grapes who are not growers. The figures given above are taken from *The Register* special report. The official statistics show a total of 2,345,270 gallons, and if to that quantity we add the wine made from purchased grapes it is reasonably certain that *The Register* estimate was under rather than over the mark. In view of the spread of phylloxera in Victoria, it is significant that the total increase in area of vineyards in that State, compared with the previous year, is only 139 acres, while the number of growers has decreased from 2,347 to 2,260. The South Australian figures show an increase of 925 acres. Compared with the figures for 1901, last year's figures show a loss to Victoria of 2,121 acres of vineyard, and a gain to South Australia of 2,459 acres.

CORRESPONDENCE.**THE DEVELOPMENT OF THE SEEDLESS CURRANT BERRY.**

To the Editor of *The Journal of Agriculture*.

Sir—Professor Perkins's comments on what I wrote under above heading call for a reply. I did not attempt to show that he was wrong in supposing that the seedless currant berry was produced under the fertilising influence of pollen, because as yet we have no proof either way with regard to this particular fruit. My object in writing was to show that what he supposed to be a law of Nature, viz., that seedless fruit requires the fertilising influence of pollen for its production, does not hold good in the case of the fig, and therefore we are not bound to think it does so in other cases of seedless fruits also. Although the fleshy portion of the fig is, as pointed out, not a true fruit, but "an abnormal development of the fruit stalk," it is just as much dependent on the seed as is the pulp of the currant berry, which fact is borne out by the quotation from Sachs. In common figs that arrive at maturity we will find that the true fruits have developed to a certain point, and then, through some unknown cause, have aborted, just as Professor Perkins described in the case of the currant berry. I do not know of any instance where fertile seeds have been obtained from figs grown in South Australia other than as a result of artificial fertilisation.

Until quite recently botanists thought that the caprification of the fig as practised in Smyrna was a superstition, not knowing that the particular variety grown there for drying will not mature its fruit without the influence of fertilising pollen as is, I believe, the case with those commonly grown in our gardens. That there is no pollen available to influence the latter, anyone that will take the trouble to study the growth of the fig will find. Take the first-crop figs, that ripen about the end of December. If they produce any pollen at all, which I very much doubt, as I have never been able to find any, it would not be matured until long after the pistillate powers had passed their receptive stage, and at that time of the year there are no other figs from which pollen could be brought, if there was any insect here that would carry it.

If Professor Perkins can, after studying the fig, find out how the influence of pollen is brought to bear on its growth, I shall be very willing to give him the honour due for the discovery, as it will clear up a difficult question. The growth of seedless fruit, without the fertilising influence of pollen, is so contrary to our preconceived notions that it is not easy to believe it possible; but in the case of the fig one cannot do otherwise until the mystery is cleared up. The argument that the fig is not a true fruit is a mere quibble. The fruits are there all the same, enclosed in the pulp; but unless they have been fertilised they have no kernels.—Yours, etc.,

T. B. ROBSON.

RESTRICTIONS ON THE IMPORTATIONS OF TREES, PLANTS, AND FRUITS INTO CAPE COLONY.

The Hon. the Premier has received through the Federal Prime Minister copies of the regulations now in force in Cape Colony for restricting the introduction of trees, plants, and fruits to that colony.

The following digest indicates the items of South Australian production which may be affected by the same:—

All trees, plants, and fruits must enter Cape Colony by sea or by parcels post.

Amongst the products absolutely prohibited from entering Cape Colony are:—Grape vines or any portions thereof (including the fruit). The Government may, however, import grape vines if deemed necessary. All eucalyptus and coniferous trees (gum trees, pines, Cypressess, etc.), are excluded, but seeds of such may be imported.

Stone fruit trees are forbidden, but, if grown in Australia the stones or pits may be introduced. All dead timber from Australia, if bark still adheres, is prohibited. With the exception of fruits, seeds, seedling and blight proof stocks of fruit trees for grafting purposes, all trees, or portions thereof,

are only allowed to enter when special permission has been granted by the Minister of Agriculture.

In no case shall a permit for more than 10 trees or 100 cuttings of any one variety of fruit tree be given, and during any year permits to any person or firm shall not aggregate more than 100 trees or 1,000 cuttings. Garden shrubs are not included in the above.

All fruits, trees, plants, packages, or portions thereof, before being admitted, must be submitted to examination by a Government officer.

All woody trees and plants and the packages containing them must be fumigated on arrival, and if this disinfection is ineffective they may be destroyed.

All fruits and packages holding the same must undergo inspection by a Government officer, who shall, if he find any insect or disease deemed dangerous to vegetation, infesting the whole or any part thereof, order such fruit and packages to be cleansed, and if dissatisfied with such attempts at eradication he may order the fruits and packages to be destroyed.

All costs of inspection and fumigation shall be borne by the importer, and no compensation may be paid for injury done to, or the destruction of, any tree, plant, or fruit in carrying into effect these regulations.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

The second ploughing of the vineyard was completed about the middle of the month, though, owing to the continued dry weather, the land was becoming very hard. Scarifying was pushed on as early as possible, the warm, dry days rendering the destruction of weeds an easy matter.

The spring racking of wines has been completed, everything in the cellars being racked.

September has proved itself the dryest on record at the College, only 0.36 in. having fallen. Our records only date back twenty-two years, but the previous lowest was 0.56 in., in 1898. Taking the year right through the rainfall is below the average, though to a great extent this has been compensated for by the way in which the fall has been distributed. The total up to September 30 is 11.46 in., against 13.59 in. for the corresponding period in 1903. Should these conditions continue it will be necessary to irrigate some patches of young trees within the next fortnight.

Consequent on the warm days, the vines have made rapid growth. There was every appearance of a very heavy vintage, but this hope has been dispelled rather suddenly. On the 28th, a clear day, with a cold, south-west wind, gave place to a colder night, and next morning the thermometer showed seven degrees below zero. In a few hours all the young growth was dry and black. This is the most severe spring frost since 1899, when eight degrees of frost was registered on October 26. Some patches suffered more than others, and again some varieties seem more susceptible than others. Shiraz and Carignan seem to be the worst affected; fortunately, the Caribernet had barely begun to bud.

Some vine-grafting has been done by the students, converting Muscates into a better paying variety. Scions of a number of varieties of olives have been secured and worked on to seedling stock in the nursery. It is intended to convert the limestone rise extending down in front of the College into an olive plantation. The few trees already there do well and produce good fruit. Olive oil making should in time take a more prominent position among our industries, and from an educational point of view a plantation of named varieties will be of benefit to the students.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on October 1, 1904:—

Throughout September rains persistently held off in the Northern wheat-growing areas, so that the month just passed, to the farming community, may be classed as one of the driest experienced for many years. On the other hand, in the pastoral country excellent rains have fallen, and conditions there are most favourable.

COMMERCE.—There has been nothing of an unusual character to report, for, although no heavy volume of business was put through, trade kept quite up to the average, and in financial circles things generally are considered sound.

BREADSTUFFS.—Throughout the month the value of wheat cargoes has continued to improve, and 35/ per 480 lb., c.i.f., U.K., for orders, is now obtainable for October-November shipments; though for cargoes which sailed in May only 33/ is offered, while August shipments are valued at 34/3. Price of wheat in Australian States was quick to follow the European advance, and 3 7/4 to 3/8 per bushel is spoken of both in Victoria and New South Wales. Here the market is fairly firm, with little offering; in fact, nearly all our surplus has been either shipped or arranged for, and with rains very badly needed in most districts, farmers are strong holders, and not inclined to meet the market. Flour.—Shipments to London and Liverpool have continued, but high freights and the high price of Wheat are likely to interfere with this business for the future. Bran has been more sought after, and the price has advanced. Pollard remains steady, with more demand from the country. Under the present dry conditions, holders of Hay are disinclined to sell, but on the other hand there has not been any heavy demand for export, whilst trade in Chaff locally has been very dull. In Feeding Grains there is little or no alteration in values to report, requirements throughout the month being only for local trade.

POTATOES.—In this line there has been an unusually heavy month's business put through, both locally and for western orders, the quality this season giving every satisfaction, especially the Glencoe grown—that the advance established in our former report has been well sustained: indeed the rates towards end of month showing a substantial advance. A few new local potatoes have been on the market, but not in sufficient quantities to affect values of old season. Onions.—As the season tapers off buyers find it, as usual, more difficult to secure samples of prime, with the result for these a sharp advance has been established.

DAIRY PRODUCE.—The unusual cold weather that prevailed throughout September enabled dairy folk to market their produce in excellent condition, and as buyers recognised that in Butters they were about at their best, bakers and packers operated freely for their future requirements, so that markets were kept well cleared, and in lower grades the month closed showing a firming of about a halfpenny: whilst in top lines factories packed the greater part of their output into bulk, which found ready buyers for the western and home market. Eggs.—Although heavy supplies for the season came forward, the strong demand for export, both to the eastern and western States, enabled values to be well sustained; in fact, September closed showing a slight advance to that of its predecessor. Cheese.—Good business has been experienced, the new makes now being marketed and ready quittance, whilst consignments of aged or dry lots have not been allowed to accumulate. Bacon.—During the earlier weeks of the month trade became exceptionally dull, this owing to the absence of export western orders; but, as buyers there have resumed operations on this market, the position of the line has recovered, with factory-cured sides showing slight advance; whilst for hams it is generally recognised that stocks are very light for time of year, so that there is a disinclination on the part of curers to sell at present quotations. Honey.—As the season for old is almost finished, sales put through have only been very moderate in character. Almonds have had better attention, several buying orders for shipment being placed here.

CARCASE MEAT.—The climatic conditions have been most favourable for the marketing of Pork and Veal, and for all well fed and slaughtered lots satisfactory rates have been realised, but for poorly fed or ill-conditioned sorts the usual difficulty has been experienced to effect quittance. Dressed Poultry.—Nice market has ruled for prime table birds.

In LIVE POULTRY there has been very strong market throughout the month, and although the penning was up to average, values obtained were quite equal to that of former.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, new, 3/6½ to 3/7½ per bushel of 60 lb.

FLOUR.—City brands, £8/15/- to £9; country, £7/10/- to £8.

BRAN.—7½d. to 8d.; POLLARD, 7½d. to 8d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/4 to 1/5; white Champions, 1/9 to 1/10 per bushel of 40 lb.

BARLEY.—Cape, 1/10 per bushel of 50 lb.

CHAFF.—£2/12/6 (nominal) per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

POTATOES.—Gambiers, £3/7/6 per 2,240 lb., f.o.b. Port Adelaide.

ONIONS.—Local and Gambiers, £6/2/6 to £6/7/6 per 2,240 lb.

BUTTER.—Factory, creamery, and choice separators. 8d. to 9½d.; best dairies and fair separators, 7d. to 8d.; well-graded store and ordinary dairies, 6d. to 6½d.; bulk butter, 8d. to 9d.

CHEESE.—Factory make, 5½d. to 6½d. per lb.; aged and dry lots, 4½d. to 5½d.

BACON.—Factory-cured sides, 6d. to 6½d.; farm flitches, 5½d. to 6d. per lb.

HAMS.—S.A. factory, 8d. to 8½d. per lb.

EGGS.—Loose, 6½d. in casks, f.o.b., 8½d. per dozen.

LARD.—In bladders, 5d.; tins, 4½d. per lb.

ALMONDS.—Soft shells, 4½d.; kernels, 8½d. per lb.

HONEY.—2½d. prime, clear extracted, in 60-lb. tins; discoloured and candied, 1½d. to 2d.

In CARCASE MEAT, handy-sized shop porkers and good baconers, 4d. to 4½d.; rough and medium, 3d. to 3½d.; prime vealers, 2d. to 3d.; poor-conditioned, 1½d. to 2d.

LIVE POULTRY.—Heavy-weight table roosters, 2/2 to 2/8; good-conditioned hens and fair cockerels, 1/7 to 2/; ducks, 1/9 to 2/9; geese, 2/6 to 3/6; pigeons, 7½d.; turkeys, 5½d. to 7½d. per lb. live weight for poor to good table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Tuesday, September 6, there being present—Colonel Rowell (chair), Messrs. F. Krichauff, A. Molineux, G. R. Laffer, J. Miller, R. Caldwell, R. Marshall, J. W. Sandford, T. E. Yelland, G. F. Cleland, and the Secretary (W. L. Summers).

The formation of a Branch of the Agricultural Bureau at Koppio was approved. The following gentlemen were appointed as members:—Messrs. G. B. Gardiner, A. Howard, J. O. Jacobs, W. T. Roberts, James O'Shanahan, D. Howard, E. Reuter, A. E. Swinburne, George Price, H. Miller, John Newell, W. Cooper, John O'Shanahan, James Borthwick, and Thomas Brennand.

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. W. McBeath, Colton; J. Dewar, Kingscote; Dr. MacMillan, H. Forster, J. Dillon, Narracoorte; C. Noble, Wandearah; T.

Camac, Riverton: L. Baldwin, A. Klemm, W. T. Frost, J. Virgo, Saddleworth; D. Major, E. F. R. Boneham, B. Lindsay, Millicent; W. Bartlett, Woolundunga; A. B. Smith, E. A. and S. Roberts, J. Bowman, W. Wilcott, E. Kelsh, Scales Bay; F. Mullett, Golden Grove; A. Clatworthy, Meadows; A. Shannon, S. Plush, A. Smith, Angaston; G. A. Solomon, Crystal Brook; J. Sandercock, Gumeracha.

The Secretary reported that 36 Branches had carried resolutions in favour of the Wilmington proposal that to permit of the introduction of fresh blood one-third of the members of each Branch should retire annually; 17 Branches opposed or were indifferent to the proposal. Clare Branch favoured removal of restriction on number of members. The Secretary suggested that the proposals might be modified by permitting of unlimited membership, but making it a rule that one-third of the members should retire annually, the retiring members to be those who had attended the least number of meetings during the year. This would give those Branches who favoured a larger membership an opportunity to increase their usefulness, while those that opposed any increase beyond the present limit would not be affected. After some discussion it was resolved, on the motion of Mr. Caldwell, that the present rules as to membership be continued.

Woodside Branch intimated that the Annual Conference of Hills Branches of the Bureau would be held at Woodside on October 21. [Any member of the Bureau desirous of attending this Conference can, on application to the Department of Agriculture, secure a certificate entitling him to obtain a return railway ticket on payment of excursion fare.—ED.]

Mr. Molineux moved that it be a recommendation to the Hon. Minister to consider whether it was possible to make arrangements for holding short courses of instruction in dairying at Roseworthy and elsewhere, for the benefit of those who could not take the full College course. He thought there was plenty of room for improvement in dairy matters, and believed that if they had the opportunity a good many of those in charge of dairy farms would be glad to attend such courses of instruction. Mr. Sandford supported Mr. Molineux. A considerable proportion of the butter reaching Adelaide from country districts was not as good as it should be, and he had no doubt that if something could be undertaken by the Department on the lines suggested the whole State would benefit. Mr. Caldwell agreed with the spirit of the resolution, but there were a good many difficulties in the way, especially in regard to teaching at factories, as had been suggested. Both in Canada and New Zealand it had proved a conspicuous failure. The work could only be carried on satisfactorily at a properly equipped dairy school. The resolution was carried.

On the motion of Mr. Caldwell it was resolved that this Council re-affirm the opinion previously expressed that the standard weight of a bag of chaff should be defined by legislation, on the lines of the Bill considered and approved by this Council.

Mr. Krichauff asked if there was any satisfactory means of getting rid of sorrel. Constant summer cultivation would, he knew, reduce it considerably, but this often involved too much labour to be practicable on a large scale. Mr. Laffer said lime was recommended by some people.

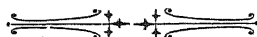
Mr. Molineux referred to the necessity for some effective action being taken to cope with the fox pest. Mr. Miller referred to the recent introduction of the mongoose to South Australia by a well-known pastoralist. In New Zealand the mongoose was introduced a good many years ago to keep down the rabbits, but in a good many districts had become a serious nuisance to poultry keepers.

It was decided that the members of the Council should, on behalf of the Agricultural Bureau, sign the address to be presented to Mr. R. Marshall in appreciation of his services in the introduction of rust-resisting varieties of wheat.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of September, 1904 :—

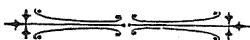
Adelaide	... 0.69	Manoora	... 0.30	Echunga	... 1.36
Hawker	... 0.31	Hoyleton	... 0.26	Macclesfield	... 1.08
Cradock	... 0.21	Balaklava	... 0.30	Meadows	... 1.47
Wilson	... 0.26	Port Wakefield	... 0.46	Strathalbyn	... 0.45
Gordon	... —	Saddleworth	... 0.47	Callington	... 0.39
Quorn	... 0.26	Marrabel	... 0.46	Langhorne's Bridge	... 0.43
Port Augusta	... 0.09	Riverton	... 0.53	Milang	... 0.61
Port Germein	... 0.35	Tarlee	... 0.26	Wallaroo	... 0.48
Port Pirie	... 0.51	Stockport	... 0.42	Kadina	... 0.84
Crystal Brook	... 0.48	Hamley Bridge	... 0.57	Moonta	... 0.45
Port Broughton	... 0.47	Kapunda	... 0.64	Green's Plains	... 0.70
Bute	... 0.50	Freeling	... 0.41	Maitland	... 0.24
Hammond	... 0.16	Stockwell	... 0.72	Ardrossan	... 0.29
Bruce	... 0.14	Nuriootpa	... 0.72	Port Victoria	... 0.33
Wilmington	... 0.19	Angaston	... 0.87	Curramulka	... 0.83
Melrose	... 0.28	Tanunda	... 0.73	Minlaton	... 0.50
Booleroo Centre	... 0.34	Lyndoch	... 0.80	Stansbury	... 0.56
Wirrabara	... 0.40	Mallala	... 0.50	Warooka	... 0.48
Appila	... 0.43	Roseworthy	... 0.47	Yorke town	... 0.51
Laura	... 0.56	Gawler	... 0.66	Edithburg	... 0.74
Caltowie	... 0.53	Smithfield	... 0.58	Fowler's Bay	... 0.05
Jamestown	... 0.53	Two Wells	... 0.36	Streaky Bay	... 0.12
Gladstone	... 0.73	Virginia	... 0.45	Port Elliot	... 0.53
Georgetown	... 0.40	Salisbury	... 0.61	Port Lincoln	... 0.68
Narridy	... 0.55	Tea Tree Gully	... 1.19	Cowell	... 0.32
Redhill	... 0.44	Magill	... 1.05	Queenscliffe	... 0.77
Koolunga	... 0.41	Mitcham	... 0.98	Port Elliot	... 0.88
Carrieton	... 0.25	Crafrers	... 2.57	Goolwa	... 0.76
Eurelia	... 0.10	Clarendon	... 1.48	Meningie	... 0.83
Johnsburg	... 0.26	Morphett Vale	... —	Kingston	... 1.36
Orroroo	... 0.33	Noarlunga	... 0.63	Robe	... 1.32
Black Rock	... 0.25	Willunga	... 1.04	Beachport	... 1.67
Petersburg	... 0.29	Aldinga	... 0.88	Coonalpyn	... 0.59
Yongala	... 0.36	Normanville	... 0.88	Bordertown	... 0.90
Terowie	... 0.34	Yankalilla	... 0.72	Frances	... 1.13
Yarcowie	... 0.51	Eudunda	... 0.54	Naracoorte	... 1.09
Hallett	... 0.38	Truro	... 0.61	Lucindale	... 1.06
Mt. Bryan	... 0.32	Palmer	... 0.17	Penola	... 1.70
Burra	... 0.55	Mount Pleasant	... 0.78	Millicent	... 2.41
Snowtown	... 0.52	Blumberg	... 0.82	Mount Gambier	... 2.42
Brinkworth	... 0.19	Gumeracha	... 1.24	Wellington	... 0.65
Blyth	... 0.28	Lobethal	... 1.21	Murray Bridge	... 0.18
Clare	... 0.43	Woodside	... 1.38	Mannum	... 0.06
Mintaro Central	... 0.39	Hahndorf	... 0.96	Morgan	... 0.15
Watervale	... 0.53	Nairne	... 0.92	Overland Corner	... 0.35
Auburn	... 0.50	Mount Barker	... 1.22	Renmark	... 0.34



DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Oct. 19	Nov. —	Meningie ..	Oct. 8	Nov. 12
Arthurton ..	20	—	Minlaton ..	15	12
Balaklava ..	8	12	Morchard ..	22	19
Booleroo Centre ..	18	22	Morphett Vale ..	18	—
Bowhill ..	21	5	Mount Bryan East ..	22	—
Brinkworth ..	7	4	Mount Remarkable ..	20	—
Burra ..	21	18	Mundoora ..	21	—
Bute ..	18	—	Nantawarra ..	19	23
Carrieton ..	18	22	Naracootie ..	8	12
Cherry Gardens ..	11	8	Narridy ..	21	—
Clare ..	21	18	Norton's Summit ..	21	18
Colton ..	1	5	Onetree Hill ..	20	17
Elbow Hill ..	18	22	Orroroo ..	28	25
Crystal Brook ..	15	—	Penola ..	8	12
Dawson ..	22	—	Petina ..	13	—
Eudunda ..	24	—	Pine Forest ..	18	22
Finniss ..	3	7	Port Broughton ..	22	17
Forest Range ..	20	17	Port Elliot ..	15	19
Forster ..	8	—	Port Lincoln ..	22	19
Gawler River ..	21	—	Reeves Plains ..	21	—
Gladstone ..	1	—	Renmark ..	20	—
Golden Grove ..	20	24	Richman's Creek ..	24	21
Hartley ..	21	—	Riverton ..	22	19
Inkerman ..	18	22	Saddleworth ..	21	—
Johnsburg ..	22	19	Stockport ..	24	—
Kanmantoo ..	21	18	Strathalbyn ..	24	21
Kapunda ..	1	5	Utera Plains ..	22	19
Kingscote ..	11	14	Virginia ..	24	21
Kingston ..	29	26	Wandearah ..	24	21
Koolunga ..	20	17	Watervale ..	17	—
Longwood ..	1 & 29	26	Wepowie ..	18	22
Maitland ..	1	—	Whyte-Yarcowie ..	15	19
Mallala ..	3	7	Willunga ..	1	5
Mannum ..	15	19	Wilmington ..	19	23
Meadows ..	31	—	Woolundunga ..	8	12



AGRICULTURAL BUREAU CONGRESS.

The sixteenth annual Congress of the Agricultural Bureau of South Australia was held at the School of Mines, North terrace, Adelaide, on September 6, 7, and 8. The following members of the Agricultural Bureau attended one or more of the sessions:—

Amyton, Messrs. J. Kelly, George Wheadon, T. B. Wicks, and J. Ormiston; Angaston, Messrs. J. H. Rundle and F. Salter; Appila-Yarrowie, Messrs. W. C. Francis, T. Lawson, J. Wilsdon, R. H. Grant, A. Fox, and W. J. Brinkworth; Arden Vale, Messrs. A. Hannemann and A. W. Fricker; Arthurton, Messrs. M. Lomman, C. L. Palm, and H. Freeman; Balaklava, Messrs. W. Smith, P. Anderson, and G. C. Neville; Baroota Whim, Mr. C. W. Hoskin; Booleroo Centre, Mr. W. H. Nottle; Boothby, Messrs. T. Robinson and A. Turnbull; Bowhill, Messrs. H. Johnson and J. Waters; Brinkworth, Messrs. James Stott and A. L. McEwin; Burra, Messrs. J. Flower and F. A. S. Field; Bute, Messrs. W. H. Sharman and M. L. McCormack; Caltowie, Messrs. A. Kerr and G. Petatz; Carrieton, Messrs. M. Manning and D. Davies; Cherry Gardens, Mr. C. Ricks; Clare, Messrs. H. H. Greenway, W. S. Birks, and J. Christison; Cradock, Messrs. P. Gillick and J. Paterson; Crystal Brook, Messrs. W. J. Venning, W. Hamlyn, J. C. Symons, and R. Pavy; Davenport, Messrs. A. McDonald and J. E. Lecky; Dawson, Messrs. J. Collins and F. Schebilla; Eudunda, Mr. W. F. Krummel; Forster, Mr. C. Payne; Gawler River, Messrs. H. Roediger, J. H. Dawkins, and A. M. Dawkins; Gladstone, Messrs. W. A. Wornum, J. C. and J. A. Gallasch, W. H. Brayley, C. Goode, and G. M. Growden; Gumeracha, Messrs. W. Jamieson and W. A. Lee; Hartley, Messrs. Wm. Brook and B. Wundersitz; Hawker, Messrs. J. Smith, A. C. Hirsch, and F. Hirsch; Inkerman, Messrs. W. W. Mugford, W. and D. Fraser, and C. E. Daniel; Johnsburg, Messrs. W. McRitchie and J. R. Masters; Kadina, Messrs. J. Malcolm, D. F. Kennedy, Paul Roach, and W. H. Kelly; Kanmantoo, Messrs. W. G. Mills and W. Downing; Kapunda, Messrs. W. Flavel and G. Teagle; Kingscote, Messrs. T. A. McCulloch and J. Melville; Kingston, Messrs. A. Neave and F. S. Wight; Koolunga, Messrs. W. T. Cooper, J. W. Atkinson, and W. Perrin; Lipson, Mr. E. J. Barraud; Lucindale, Messrs. H. Langberg and J. McInnes; Lyndoch, Messrs. J. Kluge and J. Mitchell, jun.; Maitland, Mr. W. Bowey; Mallala, Mr. J. Nairn; Mannum, Messrs. J. G. Preiss and A. Faehrmann; Meadows, Mr. W. J. Stone; Meningie, Messrs. F. G. Ayres and R. M. Scott; Millicent, Messrs. H. A. Stewart, R. Campbell, H. Holzgreffe, A. Hutchesson, and G. Mutton; Minlaton, Messrs. S. Branston and J. Boundy; Morchard, Messrs. C. Longbotham and E. D. Kirkland; Morgan, Messrs. W. Lindner and J. Pope; Mount Bryan East, Messrs. W. Dare and James Thomas, jun.; Mount Gambier, Messrs. D. A. Collins, J. C. Ruwoldt, and H. A. Wedd; Mount Remarkable, Messrs. S. Challenger and W. G. Giles; Mundoorra, Messrs. R. Harris and W. J. Fuller; Murray Bridge, Messrs. H. Patterson and W. Wundersitz; Nantawarra, Mr. A. L. Greenshields; Naracoorte, Messrs. G. Wardle and G. Williams; Narridy, Messrs. R. H. Satchell and Thomas Dunsford; Onetree Hill, Messrs. J. Hogarth and F. Bowman; Orreroo, Messrs. T. H. P. Tapscott, W. T. Brown, J. Clucas, J. Moody, W. Robertson, and W. Jamieson; Paskeville, Messrs. W. S. O'Grady and H. F. Koch; Penola, Messrs. D. McKay, W. Miller, and E. A. Stoney; Petersburg, Messrs. M. Alford and S. Bottrill; Pine Forest, Messrs. W. H. Johns and F. Bayne; Port Broughton, Messrs. W. R. Whittaker and W. Tonkin; Port Elliot, Messrs. J. Brown and W. W. Hargreaves; Port German, Messrs. G. Stone and E. G. Blesing; Port Pirie, Messrs. T. Johns, J. Lawrie, S. Crispin, E. J. Hector, and T. C. Jose; Quorn, Messrs. J. Brewster, R. Thompson, and J. McColl; Redhill, Messrs. F. Wheaton and W. Stone; Reeves Plains, Messrs. J. Carroll, J. G. Folland, and W. Day; Renmark, Mr. H. Evans; Richman's Creek, Messrs. F. H. and J. H. Lehmann; Riverton, Messrs. R. H. Cooper, T. Gravestocks, and W. B. Davis; Saddleworth, Messrs. J. H. Eckermann, G. Bengier, and F. Coleman; Scales Bay, Messrs. W. J. Thomas and D. P. Thomas; Stansbury, Mr. P. Cornish; Stockport, Mr. D. G. Stribling; Strathalbyn, Messrs. M. Rankine and W. M. Rankine; Tatiara, Messrs. W. E. Fischer, Thomas Stanton, H. Killmier, and J. Rankine; Virginia, Mr. A. Hatcher; Wandearah, Mr. E. J. Eagle; Waikerie, Messrs. E. Jaeschke and W. J. Green; Watervale, Messrs. J. G. Williams and O. H. Castine; Wepowie, Messrs. J. Orrock and J. Fisher; Whyte-Yarcowie, Messrs. T. Pascoe, J. A. Lock, A. Mitchell, J. Hunt, E. M. Jenkins, and J. McLeod; Wilunga, Messrs. J. A. Hughes and W. J. Binney; Wilmington, Messrs. A. Mas-

lin and W. Robertson: Wilson, Mr J. S. O'Grady: Woodside, Messrs. A. S. Hughes and T. Hutchens: Woolundunga, Messrs. J. Greig and N. Rogers: Yorketown, Mr. W. Correll.

The Council of Agriculture was represented by Colonel J. Rowell, Messrs. R. Caldwell, A. Molineux, J. Miller, T. E. Yelland, J. W. Sandford, R. Marshall, and W. L. Summers (Secretary). The Agricultural College was represented by Professor A. J. Perkins (Principal).

Tuesday Evening, September 6.

The Chairman of the Council of Agriculture (Colonel Rowell, C.B.) presided.

Opening Address.

The Chairman asked the Hon. R. Butler (Minister of Agriculture) to open the Congress.

The Hon. R. Butler, in declaring the Congress open, said:—Colonel Rowell and Gentlemen—I wish to congratulate the Chairman on occupying the important position of Chairman of the Council of Agriculture. I am sure no better selection for the position could have been made, and that he will worthily fill the office. This is the sixth time I have had the pleasure and privilege of saying a few words to my brother farmers in opening the annual Congress, and I have put up a record in this connection. No other position I have as a Minister gives me greater pleasure, for I realise that if this State is to progress it must be through the development of its producing industries. We can never hope to be a great manufacturing centre, but it is to be hoped that a great deal more will be done to increase our productions. I take it that that is the object of your meeting here this evening, and the object of the establishment of the Agricultural Bureau. During the past three years I think you have recognised as taxpayers the necessity of avoiding anything like wasteful expenditure, and if I have held the purse strings pretty tight, I can assure you I have only done so in the interests of the taxpayers of South Australia; otherwise I would have had to have asked for additional taxation. But I have not been so blind as not to recognise the desirableness, in connection with the work of the Agricultural Department, of spending more money—spending it wisely and in the direction of adding wealth to the State and increasing the population of the country districts. Further, I recognise that something more than we have done should be undertaken to increase our exports, and, more than that, we should see that the produce we send away is worthy of South Australia. (Hear, hear.) If we want to make a name for ourselves in the old world as producers we must see that only the very best quality products are sent away, because if we do not do that we will soon have the trade taken away from us. Foreign producers are more enlightened than they were, as I will demonstrate to you by the extracts I intend to read later on. I will show you how producers in a country where there are greater disadvantages than any against which you have to contend have been able to successfully compete for trade in the markets of the world. We will have to exercise the greatest care in the grading and packing of produce sent away to hold our own in the severe competition that is taking place in the markets. It has been stated that the changes that have been made in the Department has had an injurious effect on the Agricultural Bureau, that the Branches of the Bureau are not so active nor so energetic as they were ten years ago, and that they are diminishing in numbers. You know, of course, when you have started an organisation of this character, for a short time there is no difficulty in keeping up interest in it; but after years, when a great many of the questions have been debated over and over again, it requires a considerable amount of work to keep it a live institution. From the figures given to me by the energetic Secretary (Mr. Summers) there, however, is a larger number of Branches than ever before. There are 112 of these Branches, against 103 in 1899, there having been a gradual increase each year. Out of the first 50 Bureaus started, all but six are still in active operation, and that points to a great deal of activity having been displayed in connection with the institution. A good deal of this was due to the foresight of our old friend Mr. Molineux. (Hear, hear.) Comparison had been drawn sometimes between what we spend in South Australia and what they spend in the other States, but for that comparison to be of any worth you must weigh the results from the expenditure in each State. As I stated in the House of Assembly the

other day, we have been more economical in connection with our agricultural as well as every other public department, necessity having compelled us to do so, but I do not hesitate to say that if you review carefully the results of the expenditure in this State on agricultural work you will find that we have got better value for our money than either Victoria or New South Wales. You have heard of Government inspection in Victoria, and you know what has been the worth of it. You have also heard of the system of subsidies in Victoria, and you know into whose pockets they have gone—not into those of the producers, as was, of course, the intention of the Parliament of Victoria. If you had travelled through the three States as I have done, you would have noticed that agricultural development has gone on more rapidly here than in the other States. We have taken greater advantage of the benefits derived from the use of phosphatic manures, and our cultivation is more thorough. Where there is one acre under fallow on the other side, I think you will find twenty here. We have not got such a good climate as Victoria, but, owing largely to the energies of the members of the Agricultural Bureau, we have made better use of our knowledge of scientific agriculture. In the dairying industry we thought we would have gone ahead faster than has been the case, and it was much to be regretted that the exports from the State had fallen off as they had. Some years ago, between 500 and 600 tons of butter was exported to England, while last year the quantity was from 250 to 260 tons. I think the difficulty in South Australia—and I suppose it is the same in the other States—is to get labour suitable for that kind of work. Dairying work not only occupies people all the days of the week, but Sundays as well, and I am sure that is one of the chief reasons we do not make progress in that industry to a greater extent. We find that keeping sheep and growing wheat, which work is done to a large extent by our own families, probably in the long run pays us better. I want you during this week, when you will have various subjects under discussion, to determine in what direction public money can be spent wisely by the Agricultural Department in advancing the natural industries of the State. I can assure you of this: I will place very great weight on the decisions at which you will arrive. In connection with the wine industry, since the time you met last year the Wine Depot has been transferred to a powerful company in London, with plenty of capital, and it hopes to push the trade in England—a course that was practically suggested by our growers who have the interests of the industry at heart. The Government, therefore, considered it useless to carry on the Depot when the people it intended to benefit were opposed to the work it was doing. I do not, however, think that the money spent in pushing the wine trade in London has been lost, because in the last ten years the export of wine has been nearly double; while in Victoria, where they have expended far more money in various directions, principally in bonuses, their exports have been practically stationary, and those of New South Wales have gone back. This industry has considerable possibilities in the future. It appears to me that it is the duty of the Government to disseminate information that will be of value to the producers. I am not going to trouble you with figures to any extent to-night, but would recommend a careful study of the annual report of the Agricultural Department, consisting of the reports of the various experts of the Department. In connection with fruit Mr. E. B. Young's report showed that forty different varieties of apples had been shipped to England, and the figures were exceedingly valuable as a guide to what were the best varieties to ship to London. To-day I received the results of one of this year's shipments, and they show how different sorts vary in the same shipment. Fruit shipped by the same steamer and sold by the same agent showed a difference in the net returns of from 2s. to 8s. 5d. per case. The difference in the return was due entirely to packing and grading, to quality and to variety. I am very glad to see the fruitgrowers are combining in their own interests, and it is quite time they did so. In Victoria they are moving in the same direction. If the Government can do anything to assist them it will be only too pleased to do it. If they choose to allow us to put the fruit aboard for them, I am sure we can do better for them than any agents. Those who have had experience say that the fruit should be cooled down before it leaves South Australia, and we have facilities for doing this. In regard to freight, fruit is charged double rates as compared with meat, and it is quite time the fruitgrowers combined to secure a reduction of freight. Evidently the shipping companies have combined to keep up the freights. I think this industry in South Australia is capable of increasing tenfold if you can find a market for your fruit. You are not, however, going to find a market in London for an enormous

quantity of fruit at 12s. or 14s. a case, because at those prices a very large proportion of the population cannot afford to buy the fruit. If the grower can clear 3s. per case, the industry will become one of the best in South Australia. I have here a book entitled "Organisation of Agriculture." The writer is E. A. Pratt, and the book is worthy of careful study by any one engaged in agricultural work, or has its interests at heart. In England very grave complaints have been made by the producers concerning the treatment they receive from the railways. They say that the railway charges are too high. Further, they declare that the producers on the Continent receive much better treatment. I will read a few quotations from the book. In referring to Denmark the writer states:—"I found in Denmark that the State reduced the rates on its lines of railway in 1897 owing to an outcry on the part of the agriculturists. They learnt that there was actually a profit of 2 per cent. being made on the railways, and this profit, they declared, ought to be returned to the people. But under the altered conditions thus brought about the lines have since barely paid their way, and the rates had consequently to be raised again, the new tariff coming into force on July 1, 1903." Now, there is an analogy between Denmark and South Australia.

A Delegate.—We want a reduction, too.

Mr. Butler.—Well, you are not likely to get it. (Laughter.) The South Australian railways this year have not paid working expenses and interest by about £50,000, so they could not expect to have the rates reduced. Then Mr. Pratt continues:—"This fact led me to make a careful study of the conditions of agriculture abroad and to seek with great minuteness for the answer to the question constantly before my mind: 'How is it that the foreigners are able to send us such big loads? Are there any special advantages they possess which might be secured by the British farmer as a means of improving his own position?' And the more I enquired, the more I was met by this striking fact: That in every one of the countries now pouring their agricultural produce into Great Britain there has been an agricultural revival which has led to the spreading throughout each of them of a more or less complete network of agricultural organisation, manifesting itself in varying degrees, in the spread of agricultural education, and in combinations among the agricultural community for an endless variety of purposes, including the virtual transformation of farming methods in accordance with the latest developments of agricultural science; organisations for obtaining agricultural necessities of reliable qualities at lesser cost; the purchase in common of costly machinery which would otherwise be beyond the means of a small cultivator; the formation of co-operative societies, for purposes both of production and of sale; the setting-up of agricultural credit Banks, as a means of keeping the farmer out of the hands of the usurer, and enabling him to carry on his operations more successfully; and the improvement of the individual lot of the agriculturist in many ways. The special circumstances in which this network of organisation has been developed differ in each particular country, and it is a fundamental principle of the movement, regarded as a whole, that not only has each of the countries concerned differed from each other in establishing agricultural organisations suited to its national conditions; but the greatest degree of success has been obtained where the associations have been started on a very small scale in rural districts to meet local, or even strictly parochial, conditions, and, while maintaining their individual entity, have afterwards combined with other similar bodies to form district, county, or even national federations for the attainment of common advantages. The direct results of these new conditions have been to cheapen and to increase production in the countries concerned; to facilitate, and therefore to economise, the dispatch of the greater quantities of produce available for export; and to so far improve the general position of the foreign producers that, while Great Britain—the land whose agriculturists have been the slowest of any in resorting to all this organised effort—is still in the throes of agricultural depression, other countries, which have re-organised their methods, are proclaiming that the trials they also have had to experience have now, more or less, been surmounted." Those who are interested in these Continental countries will know that this is a striking instance of what can be done, not so much by State aid as by mutual help. Denmark is not many million acres in extent, and has a population of about 2,000,000 people to support. The producers there export to England £10,000,000 worth of butter a year. It was only fifteen years ago when the first co-operative bacon factory was started in Denmark. They treated 23,000 pigs the first year, and paid the owners about £2

9s. per head. Within the fifteen years, twenty-five of these co-operative factories have started, and have treated 770,000 pigs. Owing to the improvement that has taken place in the breeding of the pigs, etc., the price per head has increased from £2 9s. to £3 7s. or £3 8s. per head, or nearly £1. With regard to these industries in South Australia, you know it is necessary not only to find markets for the surplus produce, but to know what use we can put them to apart from human consumption. Germany last year produced 45,000,000 tons of potatoes, and the consumption there for ordinary purposes was about half of it, and Mr. Pratt thus describes the use which is made of the balance:—"But chemistry long since showed that there were other uses, besides those of direct food supplies, to which the potato could be put. Most people are aware that alcohol is distilled from potatoes, but it may be less generally known that in Germany there is a great industry in the production from potatoes of a spirit used for driving motors and engines, for lighting both in the public streets and in private houses, for heating, and also for cooking. In the course of a single year a total of 2,000,000 tons of potatoes, valued at £2,500,000, will be used for distilling purposes alone, the residues constituting a valuable food for cattle. For potato starch another 2,000,000 tons a year will be used, and of this starch the United Kingdom imported in 1901 close on 24,000 tons. Other products of the potato are starch syrup, starch sugar, dextrin, and potato flour. Germany's total export of potato flour and starch in 1901 amounted to 46,000 tons, nearly double the quantity for the previous year; and her export of dextrin was 14,000 tons." I quote this because I know people living in the South-East state that potato-growing has not paid lately. This shows the necessity for agricultural education. I hope that some day we will be able to manufacture our own goods as well as grow produce. During the past season we used 52,000 tons of commercial manures, spread over 1,400,000 acres. If anybody had said a few years ago that we would ever have used that quantity in one year he would have been laughed at. My experience has been that these manures give proportionately better returns on the lighter soils. I know country which could have been bought at 10s. per acre a few years ago, but to-day it is worth £3 an acre. This is owing to the manures and the improved system of agriculture. I said to-day in another place that I did not consider an eight-bushel average for South Australia in the future, taking one year with another, an outside estimate. (Hear, hear.) I put it this way: If we could get five or six bushels per acre before we spent a quarter of a million on these manures and adopted improved methods of cultivation, and were not going to obtain eight bushels now, I doubted if the producers would be much better off. I am very sanguine we are going to do much better than that, especially if we are careful as to what kind of wheat we sow. Although we will always have to contend against red rust, there were many good rust-resisting wheats we could grow. I would like here to express my appreciation of the valuable work done by our friend Mr. Richard Marshall in connection with the making of rust-resisting wheats of good yielding and milling qualities. (Applause.) Professor Lowrie did not seem to take much interest in the improvement of wheat by cross fertilisation, but I promise you this: we are going to take it up now in connection with the Agricultural Department, and I hope the result will be beneficial to the farmers. When I was in New South Wales I was very pleased to hear that many of the wheats which found special favour there were South Australian wheats; in fact, I believe that most of the wheats in New South Wales were originally raised in South Australia. But in Canada they seem to realise the advance of scientific knowledge in connection with agriculture. The Hon. John Dryden says:—"The gentlemen looking in my face to-day perhaps do not realise as I do the hunger and thirst that exist for information all over the country—it is not for amusement, but for information. If these agricultural societies will undertake to give this information they will be ten times as popular as they are to-day, or ever have been. This is the work that has been undertaken in these latter days by the Farmers' Institute system. The Farmers' Institute and the agricultural society should be dovetailed together. What does an agricultural society undertake to do by bringing together these animals and presenting the best products? Some people seem to think that the object is that they may give prizes to this man and to the other; but the giving of these prizes is only a means that is used towards another end. The end and object of it all, as contemplated by the framers of the Act, was to present the proper ideals to the people, so that they might know exactly what was the best thing, and what they ought to produce

in the best interests of the country. That was the idea contemplated by the farmers of the land. But the Agricultural Society stops there: that is all it can do. I can fancy a young man who is without information, but has become interested in agriculture, looking on and saying, 'I should like to know how to produce them, but your Society does not give the information. I should like to know what they mean by putting that animal first. The other one looks better to me, but I can get no information.' The only way this young man could get the information he seeks would be to attend the meetings of the Farmers' Institute, where these matters are discussed. The Farmers' Institute therefore supplements the Agricultural Society, and the one ought to be dovetailed into the other—that is, if you are endeavouring to reach the object I have set up in my own mind as being the aim and desire of every agricultural society. This emphasises the fact that there should be a closer connection between the agricultural societies and what they call in Canada farmers' institutes. People going to showgrounds often were unaware why the prizes were awarded to the animals when they saw them. I think we could do something to more closely connect the Agricultural Department with the shows held throughout the country, where they do good work." The New Brunswick Commissioner of Agriculture says:—"The demand for more and better knowledge along agricultural lines is a predominant feature with New Brunswick agriculturists, for they are beginning to realise the fact that no business or calling in life offers better opportunities for intelligent and well-directed efforts than agriculture, but to simply plough and mow, reap and sow, is no longer considered intelligent farming. Therefore the farmers of this province have awakened to the necessity of being informed along all lines of this work, for never in the history of the province has there been such a demand for printed information as the demand of the past year." In discussing the question of the duties of the State in this connection he says:—"The extent to which the State should take action in the matters under consideration is a point upon which differences of opinion may arise; but my individual conviction thereon is that the agriculturists should rely to the fullest possible extent on the two great principles of self-help and mutual help, and depend as little as possible upon State aid. My aim has been, therefore, to show what can be done by a resort to the former principles, rather than to say anything that would lead to greater dependence on the latter; and how very much there is that the British farmers can do for themselves in following examples set elsewhere has, I think, been abundantly proved." I do not quote these words to support any evasion of duty on the part of the State or the Government of a country, but think we can do a great deal by copying what other nations are doing. I think we should get the best men we can get as experts, and in various directions we are disseminating knowledge, and this knowledge has made South Australia what she is. I would like to say in connection with *The Journal of Agriculture* we have been in the habit of giving it away to the members of the Agricultural Bureau. But it should be in the hands of every producer in South Australia, and any farmer can obtain it by paying 1s. per year. It will ever be the aim of the Department to make it an interesting agricultural publication. A good deal has been said of late about the value of experimental work, and I may say that during the last few years, with the assistance of the various branches of the Agricultural Bureau, we have carried out a number of very useful experiments. The attempt was not sustained enough, and we propose to carry out experiments in a different manner over a series of years on the same land. Our experiments have unquestionably done a lot of good, and some of the results have shown that large areas of land that formerly were not appreciated by our farmers will, in the near future, be placed under cultivation. The lower part of Eyre Peninsula, for instance, is going to be a large wheat-producing district. There is a 20-inch rainfall. The country is covered with mallee, and the soil will respond splendidly to phosphatic manures. I went over there two years ago to look at the Koppio Estate, which we purchased. When we went there the country was overrun with rabbits; but I am convinced that in buying this land we made a very good bargain for the State. The purchase of the estate has given an impetus that will lead to a great settlement in that country. We have now 150,000 more acres of land available for selection, all within good rainfall area. There will be plenty of difficulties to contend against the first two or three seasons, but people will not regret going there. At Lipson, a few miles above Port Lincoln, an experiment was tried with wheat in 1902. With a rainfall of only 8½ inches between seeding and harvest a return of 3 bus. 22 lb. was reaped without manure; up to 22 bus. with manure. My own experience is that it does not pay to use commercial

fertilisers if you do not fallow the land as well. You should divide a certain portion of your land off for stock. If land is properly cultivated for a year or two you will find that it will carry double the number of stock it would before you made use of these manures. Take the Roseworthy Agricultural College, for instance. The old pastures, 14 or 15 years ago, would scarcely fatten a sheep, while now the quality of the animals raised there cannot be surpassed. While giving Professor Lowrie the credit due to him for advocating the keeping of sheep on the farm, I believe it was the opening up of the export trade in lambs that did most to induce farmers to adopt this practice. My experience was that in the past we had to be content with 4s. or 5s. for a lamb—(A Delegate—"Sometimes 3s. 6d.")—which, of course, did not pay us. The complaint has been made that the export trade has put up the price of meat. Why, it has had nothing to do with it. We have 500,000 more sheep in the inside country to-day than when we started the export trade. Instead of injuring the consumer in the city, in spite of the shipments of frozen meat sent away, we have produced more sheep and lambs than we ever did before lambs were exported. The same remark applies to other produce. If we could establish outside markets, and could supply the best produce, South Australia was going to push ahead. Since I last saw you the Roseworthy Agricultural College has given me a great deal of trouble and anxiety; but I hope the result will be more satisfactory than ever before. The Council of Agriculture made the recommendation that the two positions, Principal and Professor of Agriculture, should be divided. It was thought that a man should not be expected to manage the College and maintain proper discipline while at the same time he was expected to devote considerable time travelling about the country. Professor Perkins has taken the position of Principal of the College. I am going to select the very best man I can get to fill the position of Professor of Agriculture. I hope the proposed new Professor will do a great deal to assist the Council of Agriculture and the Agricultural Bureau in keeping the usefulness of the Department up to a high standard, and in extending agricultural knowledge in South Australia. Mr. J. Miller has suggested that the new Professor should travel about and conduct classes of the younger farmers in different centres. Such a practice has been adopted in Victoria. He might be able to do some work in that direction, and I will see if any such plan can be arranged. I can promise the Branches of the Bureau that he will devote a large portion of his time to travelling among the farmers in the various districts. In conclusion, I wish to say that this time next year I hope I will still be able to address you as Minister of Agriculture. (Cheers.)

Mr. H. Kelly moved a vote to the Minister for his excellent address.

Mr. R. Caldwell seconded the motion, which was carried unanimously.

Chairman's Address.

The Chairman (Colonel Rowell) said—I feel at a disadvantage in having to follow Mr. Butler, as I can scarcely avoid going over the same ground as the Minister. In welcoming the delegates of the Bureau to this sixteenth annual Congress one can but be struck with the amount of influence for good this organisation can confer on the producers of this State. At present there are 112 Branches, with over 1,500 members. The Bureau in connection with the Agricultural College is a splendid medium for the dissemination of information, the equal of which, I believe, is not to be found in any other Australian State. The Bureau may be described as a co-operative association in the highest sense—in teaching and learning by the experience of members, and the more the members realise that purpose of the Bureau, and act on it as such, the greater will be the success of any Branch. The member who comes to meetings to absorb, and not to diffuse information, fails to act up to the obligations of membership. None of us but can learn something from the experience of their fellow cultivators of the soil. It has frequently been stated of late that interest in the Bureau meetings was flagging. It is true that in many instances the attendance of members was not satisfactory, and that the Branch Conferences held lately had not realised expectations. However, taken on the whole, the meetings were held as often as previously, and the attendance of members, though undoubtedly not so high as it should be, was up to the average. It is disappointing to note that, except in a few localities, it seems impossible to get the outside public to attend Bureau meetings, and the difficulty of overcoming this indifference has been a matter of frequent comment. During the year there has been considerable discussion on the proposals of the Wilmington Branch that one-third of the members should retire annually,

being eligible for re-election, and that the election should always be by ballot. Thirty-six Branches supported, and seventeen opposed, or, at any rate, were indifferent on the subject. Clare Branch suggested that the membership be unlimited. The Council of Agriculture has given careful consideration to this matter, and has decided to allow matters to remain as at present. In connection with the work of the Bureau, it is interesting to note the improvements made during the past fourteen or fifteen years in connection with cultural work. In farming the most prominent of these are the use of manures, the extension of the practice of fallowing, of keeping sheep on farms, the poultry and dairying industries, and the improvements of wheats, particularly in respect to rust resistance. In connection with this, I am pleased to see with us to-night a gentleman who has done so much for the farmers of this State. I refer to Mr. Marshall, whose work I am pleased to see is to be in a small measure recognised by us. The latest agricultural statistics show that whereas seven years ago the land under fallow was 512,561 acres, or equal to less than a quarter of the total area under cereal crops that year, last year the area of fallow land was 1,010,141 acres out of a total of 2,147,491 acres under cereal crops, showing that the proportion of fallow had more than doubled in seven years. Regarding the dairying industry, figures show that we have practically got all and a little more back than we lost during the drought. Last year's butter yield was, I believe, the highest on record, and, as supplies have kept up unusually well during the winter, and we have a promise of good feed in most dairying districts well into the summer, it will not be surprising if we beat last year's figures. There is no question that South Australia is better fitted for dairying than many people imagine, and it would undoubtedly be to the interest of the whole State to see a marked increase in the dairying industry, as, while the returns per acre are, comparatively speaking, large, the cost in labour of earning these returns is also much greater than in, say, wheatgrowing or sheepfarming, and the employment of a large rural population will undoubtedly help to maintain the commercial prosperity of the State. In connection with the fruitgrowing industry, twelve years ago most growers considered that the various diseases to which our fruits and fruit trees were subjected were unconquerable. To-day it may be safely averred that the men who suffer most severely are those who neglect to try the various remedies for the destruction of the pests. To give an idea of the proportions our fruit industry is assuming I will instance: the production of currants. Whereas in 1897 we produced 97,104 lb., last year (1903) our output was 1,165,472 lb., and, as the demand within the Commonwealth is still four times as much as the output of Victoria and South Australia, there is every prospect of this branch of fruitgrowing being decidedly profitable for many years to come. As a fruitgrower, I would like to refer to the export of fruit to oversea markets. The future of the industry is bound up in this trade. During the past season we have sent away nearly 100,000 cases, and, though the past season's operations have not been a success, I believe there is no ground for alarm, and that under ordinary conditions the prices realised in London would leave a fair margin of profit to the grower. Improvements in the methods of marketing and in the carriage of our fruit were, however, absolutely necessary. The fruitgrowers, in fact the whole community, have good ground for complaint against the policy of the shipowners carrying refrigerated produce, and also their unfair stand in reference to the safe carriage of such produce. At present Australia pays over a quarter of a million sterling to shipowners for carriage of refrigerated produce, and South Australia's share of this comes to over £30,000. Although freights are excessive, shipowners repudiate all responsibility for even fitting up the chambers properly and delivering the fruit in sound condition. Should any shipper have the courage to demand compensation for loss caused by neglect on the part of the Company's servants, he is referred to a strong ring of shipowners formed to fight any such claim. The South Australian Fruitgrowers' Association is acting in conjunction with similar associations in the other States with a view to securing an alteration in respect to this matter, which affected shippers of all classes of refrigerated products. I would appeal to all fruitgrowers connected with the Bureau to join the Association and assist in this and other matters. In connection with the recent alterations in the Department, the members of the Council of Agriculture believed that Professor Perkins's appointment as Principal of Roseworthy College was a step that would be fully justified by that gentleman's work. They were glad to know that a Professor of Agriculture was also to be appointed. Under the new arrangement he believed the members of the Bureau and the general public would have every reason to be satisfied.

Mr. Robertson (Wilmington) said he wished to draw attention to the proposal of the Wilmington Branch to alter the rules in respect to membership. He understood that the Council of Agriculture had decided that the proposed alteration should not be made. He did not think that a decision on the question should be come to by the Council of Agriculture, but by Congress.

Mr. J. Miller stated that when the subject was considered by the Council of Agriculture it was alleged that only about one-third of the Branches had voted in favour of the suggestion. Seventeen Branches were opposed to the proposal, and 33 in favour of it, while there were over 100 Branches.

Mr. Robertson (Wilmington) said the notices proposing the suggested alteration were sent to only 64 Branches. Fifty-five replies were received, and of these 37 were favourable, while others were unfavourable, and some were undecided. He considered they, therefore, had a two-thirds majority in favour of the alteration.

Mr. R. Caldwell thought that effect should not be given to the proposal of the Wilmington Branch. The position the Council of Agriculture took was that it would be unwise to allow any suggestion affecting the constitution of the Agricultural Bureau to be enforced unless a majority of the whole of the Branches were in favour of such a proposition. The rules had worked well for a number of years, and if any alteration were made it should be by a two-thirds majority of the Branches.

The Chairman said the matter was to be brought before "Free Parliament," and no decision would be come to that night.

A delegate said the dairy industry in this State was not progressing so satisfactorily as in Victoria. Perhaps the cause was that our dairymen were not going to so much trouble as were the Victorians in housing and rugging cows in cold weather. A higher percentage of butter and milk was got from the cows in Victoria.

FUTURE MEETINGS OF CONGRESS.

Mr. W. L. Summers said it had been suggested that in order to prevent the Thursday evening meeting of the Bureau clashing with the annual meeting of the Farmers' Union the meetings of Congress should be started on Tuesday morning instead of Tuesday evening in future. The question was: If the alteration were made, would a number of delegates fail to attend the opening ceremony?

Mr. R. Caldwell thought that the suggestion was a good one, and moved:—"That in future Congress be opened on Tuesday mornings."

Mr. Gleeson (Carrieton) moved as an amendment:—"That the Congress be opened on Tuesday evenings, as at present." He thought that people living on the narrow gauge railway line would be unable to be present on the Tuesday morning unless they came to Adelaide at the end of the previous week. He had been travelling from his home since Monday, and had only just arrived in the city.

Mr. J. Malcolm (Kadina) considered that it would be unwise to alter the time of the opening of Congress if by doing so they would interfere with the attendance of delegates. Supposing they shifted the time for the opening of Congress, what guarantee would they have that the Farmers' Union would not want to alter the date of their meetings again?

On the suggestion of another delegate Mr. Caldwell agreed to amend his motion to the effect that the matter should be considered by the Branches of the Bureau, and this was carried.

Wednesday Morning, September 8.

Mr. J. Miller (Vice-Chairman of the Council of Agriculture) occupied the chair, in the absence of Colonel Rowell.

Mr. H. A. Cowan, of Onetree Hill Branch, read the following paper:—

LUCERNE-GROWING.

Lucerne is one of nature's grandest fodder plants, and has been known for a good many centuries. Hartlib, an English writer, urges the value of this

plant for English farmers, in a work published in 1651. He quotes Columella, of the Roman period, as an authority on lucerne-growing in those times, who says that the plant would last for ten years, and may be mown for four years seven times a year. So we find it was known and valued at that early period.

Leaving the past and coming to our own time, its good qualities are well known and utilized throughout California and the Eastern States of America, and millions of acres are now under lucerne in Argentine, but it is greatly neglected in South Australia. It will grow in almost any soil, but best results will be obtained from deep black loam or chocolate soils, which are rich in lime, potash, and phosphoric acid; but owners of poorer soils should not neglect lucerne, as it will pay on a variety of soils. It often does better in stiff clay lands than in those of freer character, owing, no doubt, to the quality of the subsoils.

I would strongly recommend stock owners generally to plant lucerne for grazing purposes, even without the aid of irrigation; many have neglected lucerne because they thought it could not be profitably grown unless watered. Select a plot on the farm with a good strong subsoil, that will retain moisture, and if it is low lying so that it gets some of the drainage from the surrounding land, so much the better. Care must, however, be taken that the water cannot lie on the surface too long, or the plant may perish. Having chosen the plot, plough it deeply early in the winter, and work it well, to get it fine, and free from lumps. To make a really good preparation, the ground should be ploughed with a subsoil plough, as it saves time, gives a stronger plant, and therefore pays for the labour.

I have found that early in August is the best time for seeding on the plains, though I should think a month later would be a good time in the hills, where the weather is colder and the frosts more severe. I have used colonial seed, the germinating energy of which I tested by putting some of it into wet flannel and keeping it moist by a window, where the sun could heat it. The seed was sown with a Massey-Harris drill, with grass seedbox attachment, set to sow 10 lb. of seed per acre, and 90 lb. superphosphate, at a depth of 1 inch to 1½ inches. The grass seedbox has small tubes leading into the larger ones, and the seed and the manure go through the hoe together. Sixty acres have been sown in this way; the first 20 acres early in September, 1901, in dark, free soil, with a limestone subsoil. This came up splendidly, and has a good, strong root and crown; but the return is not as good as it ought to be, on account of the limestone subsoil allowing what little rain that falls to drain away too quickly. The next 40 acres were sown early in August, 1902, in stiff, red land, with clay subsoil. This also came up well, and gives much better returns than the first 20 acres. You will notice that this lucerne is still very young, and has not got its roots down far yet: but the only time it failed to have a green bite for the stock was during March and April of this year. The 1½ inches of rain about April 18 made it shoot ahead at once, and I had good feed right up to the end of June. Since August 14, I turned 26 cows and 7 horses each night on to a 20-acre paddock of lucerne, which was about six or eight inches high. From my experience of these sixty acres, I am thoroughly convinced that 5 lb. of seed, drilled in as described above, is sufficient.

The young plant should not be allowed to blossom during the first year, as it exhausts the plant. Either lightly stock it to keep it down, or, better still, if you can spare the feed, mow it off, and let the cut stuff lie on the ground as a mulch. It may want feeding or cutting off two or three times the first summer. Lucerne should always be divided into several paddocks, so that it will get rest, and not be kept always bleeding. My sixty acres are divided into four paddocks at present, but two of these paddocks will be divided again, so as to make six paddocks of about ten acres each. It will deteriorate after the third year if neglected, but with proper care and attention it will last, not five or ten years, but fifty years. Within the last few days I have read of a field of lucerne in America which, at sixty years old, was doing as well as ever it did in its younger days. When the lucerne is cut down or the stock are removed from a paddock during the first year it should be lightly harrowed, in the second year heavily harrowed, and after the second year disc harrowed.

During the second year I have used a cultivator instead of heavy harrows. The Americans use disc harrows. By the following accident they discovered that discing lucerne improved it greatly. In Kansas a field was sown in the dry year of 1894, but it did not get a good stand, so in 1897 pigs were turned on and fed it down closely, being taken off early in the fall. The field was then

disc harrowed, with the discs sharp, and set at as great an angle as possible, then cross disced. The ground was thoroughly pulverised, and the lucerne apparently destroyed. After this rough treatment, however, it came up strongly, and was much better than it had been before. As a general rule the Americans have the disc set so that they barely turn the soil over, at a depth of two inches. This splits up the crown of the plant, but does not cut the tap root.

If at any time you have a good growth of lucerne, which is not required at once, it should be made into hay. Cut when the crop is about one-third in bloom, as the largest amount of digestible matter is obtainable then. The plant should not be allowed to stand later than the early blossoming stage, as it becomes hard and woody, and rapidly decreases in food value. It is a rather difficult matter to make good lucerne hay, and can only be acquired by practice, but it is a useful reserve food in any form, from good hay to indifferent ensilage, and none need be wasted. If the hay is put into stack before the stems are cured, it is very liable to heat and mould, but if allowed to lie on the ground too long the leaves will get dry and drop off, and the most valuable part is lost. In the Eastern States of America the general practice is to cut the lucerne in the forenoon, then rake it up and cure it in windrows, after which it is put in cocks five or six feet high, as small as will stand. The length of time for leaving in windrows or in cocks must always depend on the weather, stage of growth of the plant, etc., and experience must guide each individual as to treatment that will give the best results. A heavy rain on the hay before it is carted in will depreciate it 50 per cent. Therefore, choose a time to make hay when the weather prophets are predicting a few days' fine weather.

On a farm in which I am interested we cut lucerne which grows just about an inch a day when irrigated. On one occasion we measured 27 inches in 30 days. Lucerne will yield, with ordinary good care and the necessary heat and irrigation, from one to two tons per acre every four or five weeks. The sun power in this country is not half appreciated by graziers. It enables us to keep lucerne growing nine months of the year, and it will pay to raise water from any moderate depth to utilize that power. It was at one time freely asserted that this was an exhaustive plant, and that it impoverished the land. The Americans have shown this to be a fallacy, that it is a storer of nitrogen, and that lucerne land ploughed up after six or eight years, will yield from 35 to 50 per cent. more of maize, wheat, barley, or oats, than equally good land alongside it, which had been farmed with the usual rests. It is a deep feeder, and in free alluvial soils of river flats it will send its roots down 30 or 40 feet, if they do not find moisture enough at shallower depth. Lucerne has its enemies, as other plants have, and the ravages of the flea are feared by some. No doubt it is a nuisance, but so are all parasites, frosts out of season, hot winds, locusts, etc. The points I desire to urge on every blocker, farmer, grazier, or poultry owner, without regard to the extent of their operations, are: The strong vitality of the plant; its deep feeding habit; its universal adaptability as stock food.

Why should America be raising immense numbers of stock, including pigs, on lucerne, without the aid of any other food, and in South Australia you may travel 20 miles and see stock without hope of a green mouthful until rain falls and grass has time to grow? It is not pluck or ability that is required, but a spirit of enquiry and emulation, combined with a little determination to experiment. A little less independence of character, and a little more willingness to follow the experience of others, would oftentimes result in improving our methods.

Mr. W. E. Fisher (Tatiara) thought lucerne well deserved greater attention than it received at present. In the Tatiara district the best plan was to plough the land well and sow the seed with the cereal crop. Generally the land was not ploughed deep enough for lucerne. A friend of his had asked if he could get the Siberian lucerne, which was said to be very hardy and productive.

Mr. F. G. Ayres (Meningie) said he had planted lucerne with wheat in his district, but it was a failure.

Mr. F. S. Wight (Kingston) stated that he had a small plot of lucerne which was planted with a crop in May, the bottom soil being sandstone, and the plant was growing well.

Mr. H. Evans (Renmark) considered that a light dressing of superphosphate when the lucerne seed was sown would assist it.

Mr. J. Malcolm (Kadina) thought that as lucerne had been grown at Wailaroo, it could be grown almost anywhere else in the State. He agreed with the statement that lucerne was a very hardy plant. If people would only plant a little they would soon become convinced that it would pay them to grow it. He had been successful with it, although it had cost him 2s. per 1,000 gallons for water for irrigation. He planted a quarter of an acre as an experiment, and it was a great success, the lucerne growing to a height of 4 or 5 ft.

Mr. D. F. Kennedy (Kadina) said he could endorse Mr. Malcolm's remarks. In his opinion, every farmer should try to improve his position by growing some kind of fodder plant. Thirty-five years ago he had seen lucerne growing in the Mount Gambier district, where it was sown with the wheat crops by a farmer who used to travel about the country buying cattle. These he would place on the lucerne, and then, in March and April, they were sold as fat cattle. Mr. Bowes had told him that he had made between £300 and £400 a year on his stubble land in that way.

Mr. J. A. Lock (Whyte-Yarrowie) had sown two acres with lucerne on a flat where the flood waters could run over it. Seed was put in in September, and the lucerne fed off three times during the summer.

A delegate said he had had considerable experience with the growing of lucerne and other fodder plants, and had found that none other gave such good returns as lucerne. He had had the best results in the Riverton district by sowing the seed in April. He had 30 acres under lucerne, and the crop was so heavy that he could not cut it with the binder.

Mr. W. H. Nottle (Booleroo Centre) said that although he lived in a pretty dry district he had tried almost every kind of fodder plant he could get hold of. None had lived so long as lucerne, but he did not believe even this plant would pay in the dry, northern country, as it did not last long. He had sown a little lucerne, mustard, and rape in a paddock, and found that the pigs would eat nothing else if they could get the lucerne.

Mr. J. Wilsdon (Appila-Yarrowie) stated that he had done well in lucerne growing, and thought the plant would thrive in most parts of the State.

Mr. J. G. Preiss (Mannum) declared that he had put in half an acre of garden land with lucerne, and, although the rainfall was barely 9 in., it came up and grew till about November, when it dried off. When the rains came again it grew like spear grass. Afterwards he tried to plough it up, as he wanted his garden for something else, but failed to get rid of it. Two years later he put sheep on it for about three months, and that put an end to the lucerne. (Laughter.) He got a cutting about every three weeks, that was from land that had been flooded. He wished the writer of the paper would tell him what kind of seed he had sown.

Mr. Cowan replied that it was the ordinary lucerne. He had not heard of the Siberian before that day.

A Lucindale delegate said he sowed about 1s. worth of seed to the acre in his wheat crops every year, and got a good summer crop for his sheep.

Mr. A. L. McEwin (Brinkworth) thought there was a point that had been overlooked. It was at the bottom of everything, and that was pounds, shillings, and pence. It was no use growing lucerne at a cost of 21s. for 20s. worth of the fodder. In the district from which he came two sheepowners had sown lucerne, thinking it was worthy of trial. It had given them a good deal of feed in their stubble paddocks, and it was said that the stock wanted something like this on the stubbles to help to keep them in the right condition when ordinary feed was dry. In the North, lucerne could only be relied upon in two seasons out of five. It was no use talking of results on a small plot: they wanted to know what returns they would get from, say, 60 acres.

Mr. J. Smith (Hawker) considered that Mr. Cowan's paper was a sound, practical one. He would not have risen to speak but for the remarks of the last speaker. He would tell them his experience in the Far North—in about the driest place where farming was carried on in the State. There were several plots of lucerne growing well in Hawker. He had raised an embankment around a quarter of an acre, so that he could flood the spot in the event of heavy rains. He had flooded the plot three times this year. It was all very well to talk about going in for lucerne on a large scale. They must

do it on a small scale first. (Hear, hear.) If they succeeded, then they would soon get 60 acres under lucerne.

The Chairman said it had been considered that land about the Broughton was not suitable for lucerne-growing, but Mr. Wake had hundreds of acres on which wheat, 2 ft. high, and lucerne, 18 in. in height, were growing. He reckoned that he would get a very heavy crop of lucerne hay. Since it had been proved that that land could grow lucerne, its value had been doubled.

Mr. Challenger (Mount Remarkable) thought that two or three rules should be observed to grow lucerne profitably. In the first place they must have water within a given distance from the surface. Then it was no use to attempt to grow it on the side of hills. He had been able to grow lucerne, but the third year it disappeared, and weeds took its place. The greatest difficulty was with the weeds.

The Chairman said Mr. Wake cultivated his lucerne land with harrows, and in that way scratched all the grass out of the crops.

Mr. McGregor Dey (Gilles Plains) said he had some land on the banks of the Torrens, and there he eventually intended to grow fruit trees. He asked whether it would do any harm to sow lucerne on the land in the meantime. He wanted to know whether he could get rid of the lucerne if it were planted, and whether it would impoverish the soil in any way.

Mr. Evans (Renmark) said that some years ago he planted lucerne for the express purpose of benefiting the ground. He found that where the land before was unfit for trees, now it was good soil.

Mr. W. L. Summers said he did not know any lucerne by the name of Siberian, but believed it was really the Turkestan, which was introduced by the Agricultural Bureau some years ago. Seed of it was sent to farmers so they could carry out trials, but the replies received stated that it was no better than the ordinary lucerne, and some said it was finer in growth and much weaker. He advised Mr. Dey not to sow lucerne on his land if he intended planting fruit trees there shortly.

Mr. R. Marshall said he and his sons had sown 1,500 acres with wheat in a year, and they ran strips of lucerne through the crops. They found it paid well; they mixed the seed with the wheat when sowing.

Mr. Cowan, in replying, said he had kept twenty cows in milk during the summer with the aid of his lucerne plots. The animals were in good condition, and the milk supply was kept up; but if he had not grown lucerne he would have got very little milk without feeding them on plenty of bran and chaff. The lucerne had benefited him as much as a good crop of hay. In reply to Mr. Challenger he wished to say that over all his 60 acres the water was 60 ft. or more from the surface. With regard to the delegate who had planted lucerne several times without success, he thought he must have fed it off too closely, and that he had failed to cultivate the field properly.

COMPLETE HARVESTER.

Mr. J. H. Lock (Whyte-Yarcowie Branch) read the following paper:—

In initiating a discussion on the use of the complete harvester, which has of late years become so popular, I particularly wish to refer to the statement of a gentleman who has been closely identified with the wheat trade of South Australia for many years. He states that often owing to the wheat being reaped by the harvester a little too soon, and to the grain going direct into the bags when somewhat damp, attack by weevil, heating of the grain, and serious shrinkage in weight have frequently resulted, and he warns farmers of the necessity for exercising care in the use of the complete harvester. This is doubtless a timely warning, as if his conclusions are correct the farmer can rest assured that the wheat merchants will devise means to protect themselves and throw on the growers any losses that may occur in this way.

One of the many benefits claimed for the harvester is that the crop can be reaped earlier in the morning and on days when it would not be possible to use the ordinary stripper, so that there may be something in the contentions of the merchant referred to. Any wheat harvested when thoroughly ripe and dry would, of course, be free from any of these objections, but can the farmer afford to wait until the crop is in such condition before he commences to harvest his wheat? Does he not run risk of greater loss by storms and

rain than any damage that may occur to the grain from being bagged by the harvester before it is quite dry? No farmer will question the fact that by the introduction of the damp-weather stripper and the complete harvester the harvesting operations have been greatly facilitated. With the former machine no complaint of injury to the grain resulting from its being reaped when slightly damp has been made, but this, of course, may be due to the fact that the wheat is left in the heaps until it can be winnowed and bagged. With the complete harvester, however, it is not unreasonable to argue that, as the wheat goes directly into the bag, sometimes in a damp state, some ill-effects may be noted. If, however, it should prove that harm does result, it was within the power of the farmer to avoid it by shooting out any wheat that is reaped when damp, and leaving it for a few days to dry before re-bagging. The wheat could easily be emptied from the harvester box on to a tarpaulin and allowed to remain in the sun to dry. Even if this should be necessary the labour involved in harvesting the crop would be much less than with the ordinary stripper.

All those who have used a complete harvester know that it has many advantages over the stripper. A good harvester costs no more than an ordinary stripper and winnower, while the cost for wear and tear is very little greater. The labour involved in harvesting with the complete harvester is much less than with the stripper and winnower, and the grain is safely under cover in a much shorter time. The cost of reaping 1,000 bags of grain with the complete harvester is very little more than the cost of stripping the same quantity, while the risk of injury to the grain in the wheatheaps, and the cost of winnowing and bagging, which at 6d. per bag would amount to £25, would be avoided. A farmer with about 300 acres to reap would be able, with the complete harvester, to finish harvesting operations in but a little longer time than it would take him to strip the crop with an ordinary stripper, besides saving the expense for labour of three men winnowing the grain. This saving alone would more than pay for any loss that might occur on grain that has been harvested when damp. In reference to the statement that harvester wheat was liable to serious shrinkage, all of them knew that if they stored wheat for any length of time there was a perceptible increase in the weight, varying according to the condition of the wheat when it went into store. While the wheat merchant was loth to admit this, he was ready to cry out about any shrinkage in weight, however slight.

There was no doubt that, the complete harvester being considerably more complicated than the stripper, the wear and tear, as was only natural, would be greater; but I am certain that with the competition amongst the different makers, and with the experience they were gaining, this would be greatly reduced in the course of a few years, and the working parts much simplified. I believe that the complete harvester will prove a great boon to our farmers, but I would emphasize the necessity for care in respect to the bagging of damp grain.

Mr. J. Malcolm (Kadina) said the first portion was quite in accord with what he knew on the subject. Twopence and threepence per bushel had to be docked on moist wheat. It must, however, be remembered that last harvest was an exceptional one. Wheat brought in in the damp state and left in the stack for a short while deteriorated. He believed the complete harvester had come to stay, and as regards the damp grain, perhaps the farmers were to blame for reaping before the grain was ripe.

Mr. G. Stone (Port Germein) said he bought a complete harvester three years ago, and it gave him every satisfaction. With it he could take off wheat when he could not with the ordinary stripper.

The Chairman—The wheatgrower can take the crop off with the ordinary stripper if he liked as early as with the harvester. (Hear, hear.) When the old strippers were worn out he certainly would advise them to buy complete harvesters.

Mr. J. G. Folland (Reeves Plains) thought that the writer of the paper rather under-estimated the saving in labour by the use of the complete harvester. As regards the reaping of wheat in the green state, he said the greener he took off King's Early wheat the better sample it made. No complaint had been made about any of the wheat he had sent to the mill. He believed it would pay not to expect the complete harvester to clean the wheat for market, but to put it through the winnower, because then they would have a uniform sample. Another reason why they should put it through the winnower was

because they were bound to get a little chaff in the wheat with the complete harvester.

Mr. T. Dunsford (Narriby) said he was a believer in the stripper and winnower. They must not forget that exceptional weather was experienced in the 1903-4 harvest, when the complete harvester was said to have done good work. Cocky chaff was of value to the farmers. The draught of the complete harvester was 20 per cent. more.

Mr. H. Freeman (Arthurton) stated that he had been working with harvesters for the past three years. Working with four horses he had done 12 acres a day and with a change of teams 15 acres a day. The number of acres credited to each machine was 350.

Mr. D. F. Kennedy (Kadina) said he placed weight on Mr. Freeman's statements, because he knew he was a practical farmer. The question was whether the complete harvester was a better all-round machine than the stripper. Mr. Freeman had said the harvester had taken off 12 acres of wheat a day with four horses; he had known a machine with three horses take off 10 acres. It was the winnowing part of the harvester that gave the farmers most bother, as it soon got out of gear and steadiness. They could always reap a crop, but it was the question of cleaning that wanted attention. If they wanted to sell their wheat it would pay them to give it an extra cleaning.

A delegate said he thought the complete harvester was not going to be a success in hilly country. His neighbour had purchased a complete harvester, and since then had been buying ordinary strippers. That did not speak well for the harvester. He had tried drying wheat on tarpaulins and also in bags, and found that it dried better in the bags. Nothing had been said definitely whether it was cheaper to harvest the wheat with a complete harvester or a stripper. He did not believe it would be much cheaper with the harvester. They had to have two men and four horses with each harvester.

Mr. R. Thompson (Quorn) thought that most of the delegates had agreed that the harvester had come to stay in certain parts of South Australia; those parts were where the farmers had a certain rainfall. To those who had strippers he would say they should not, by purchasing harvesters, put millstones around their necks of which they could not rid themselves.

Mr. A. L. McEwin (Brinkworth) considered that this was a matter on which every man should be guided largely by his own judgment. There was a great deal to say on both sides of the subject. They had to consider the extra number of horses that would be required to work the harvester. In the first place a complete harvester cost £80 or £90, and farmers who already had reapers and winnowers should think a great deal before they threw them away for the other machine. He sold a parcel of wheat, to be delivered on November 1, and he started reaping with his ordinary stripper. His neighbour, who had a complete harvester, went to assist him, but was unable to reap the wheat with the harvester, as he said it was too green. Mr. McEwin declared that he sold 250 bags of this wheat in April, and among it was 17 bags that had been reaped by his neighbour's harvester. He was docked on those 17 bags. That showed that they could not reap so early with the harvester as with the ordinary stripper. He took off 400 acres of wheat every year with two ordinary strippers, and his crop was harvested sooner than any other in the district.

The Chairman said he had had a harvester for three years, and it had given satisfaction in every way. With his machine he took off more than 1,600 bags last season, and his neighbours were complaining that it was too wet to work the winnowers while his was in the bags.

Mr. Lock, in reply, said he was not going to advise them to purchase the complete harvester. They should be careful in reaping in damp weather. The harvester was going to be a great boon to the farmers of South Australia.

Wednesday Evening, September 7.

FREE PARLIAMENT.

Mr. J. Miller presided, and said Free Parliament would be conducted by Congress. The discussion on each subject would be limited to 15 minutes.

MEMBERSHIP OF THE BUREAU.

Mr. W. Robertson (Wilmington) moved:—"1. That it be a recommendation to the Council of Agriculture that one-third of the members of the Branches of the Bureau retire annually, but are eligible for re-election. 2. That candidates be proposed by a member, or may propose themselves, for election on Branches of the Bureau. 3. That the election of members be by ballot by the sitting members, subject always to confirmation or rejection by the Council of Agriculture." He said the object of the proposed alteration was to infuse new blood into the membership. That meant the introduction of new ideas. There was no other institution in the world, he thought, where members became life members from the date of their introduction. If they excluded young men they would be doing an injury to those who were to take their places when they passed away. If they now had a member who was one of the greatest duffers imaginable, they would be unable to turn him out of the Bureau. He thought it imperative that the Council of Agriculture should take the initiative in this matter. The reason of the proposal to allow members to nominate themselves was, because supposing a man went into a district unknown they might lose his services, which might prove very valuable, through members not knowing much about him, and consequently not caring to propose him as a new member, through fear they might be placed in an invidious position.

Mr. W. A. Wornum (Gladstone) seconded the motion. He thought that if effect were given to the proposal better work would be carried out by the various Branches than at present.

Mr. H. H. Greenway (Clare) moved as an amendment:—"That it would be to the best interests of the Bureau if the restriction as to the number of members of the Branches were removed." As Secretary of the Clare Branch he had done all he could to popularise its meetings; but had found great difficulty in getting an attendance of members. When a member of the Branch went to considerable trouble to prepare a paper, it was no encouragement to him to have to read it to only six or eight other members. He had tried to get visitors to go to the meetings, but they would not, as they did not care to go on what they considered was sufferance. He thought all agreed with the delegate from Wilmington, that they should secure the services of the young men, and the question was: What way were they going to do this? He thought the amendment would put matters right. They still wanted old members, with their long experience; but the assistance of young men at the same time.

A Gladstone delegate seconded the amendment. He had never understood why the membership of a Branch should be limited to 15. Some of the old members had done splendid work, and there was no reason why they should not continue members, as they were never too old to learn. If they had old and young members, he thought that some really good discussions would take place between them.

Mr. W. Bowey (Maitland) thought it would be better if the Agricultural Bureau abided by the resolution submitted at the last Congress by the Maitland Branch, by which a Branch that wished could have an honorary membership. The old men would retain their membership on the honorary list, and room also would be made for younger men. He would like the Secretary of the Agricultural Department, if he could, to state the result of that discussion, as he believed the motion had been carried.

Mr. Summers replied that any Branch of the Bureau could appoint as many honorary members as it wished without consulting the Department.

Mr. T. Gravestocks (Riverton) did not see that there was any necessity for an alteration of the constitution of the Branches.

Another delegate said he thought that if they had younger members they should be on the same footing as the older ones. They should have as many members as possible, and if they resolved to do this they would only be doing the same thing as was done by other societies.

Mr. W. C. Grasby thought they could not adopt any resolution that would give greater effect in increasing its usefulness than the amendment moved by Mr. Greenway. It seemed to him an absurd thing to stipulate that the membership in any district should be limited to 15.

The amendment was carried by a large majority.

THE AGENCY NUISANCE.

Mr. H. Freeman (Arthurton) said he wished to speak on the agency nuisance and its cure. It was time they took some steps in this matter, as the agents were a great bother to the farmer. There were machinery, manure, sheep, and other agents, and the cure, he thought, would be found by following the example of members of the Arthurton Branch, who had pledged themselves not to deal with agents, but the principals of firms. One or two members act on behalf of the others for the year, ordering all the machinery, manure, etc., required by the members, and no expenses were incurred except for telegrams or postage. They had been working on this plan for some time, and it had given great satisfaction. He moved:—"That the members of Branches agree not to deal with agents."

Mr. Lomman (Arthurton) seconded the motion. He said the members of his Branch got their goods at bedrock prices through adopting this co-operative system.

Mr. R. Cooper (Riverton) thought that they were wasting time in discussing such a frivolous matter. If a man had not sufficient backbone to deal with an agent, then he deserved to make purchases he did not wish or have his time wasted.

A delegate said he thought that there was something more in what the members of the Arthurton Branch spoke of than was apparent at first. Not only would the agents stop the farmers in their work, but also the workmen, and they would not take "No" for an answer.

Mr. J. A. Lock (Whyte-Yarcowie) thought it would be out of place for Congress to pass any resolution against agents. Let the farmers co-operate, and let the agents die a natural death.

Mr. A. L. McEwin (Brinkworth) said he wished Mr. Freeman had mentioned when he was submitting his motion that he had purchased 15 machines for residents on Yorke's Peninsula. He was sure the Arthurton Branch was doing good work in this connection. However, he would not like to see the motion passed, because people would say that farmers were too thin-skinned to deal with agents.

Mr. Freeman said he had bought 15 harvesting machines and 500 tons of manures in one line, and had not got a halfpenny himself out of the purchases. By combining in this way they had, however, got their requirements at 10 per cent. to 15 per cent. discount. (Hear, hear.)

A delegate said he had sold hundreds of tons of manures to other farmers, and that if it had not been for the agents not nearly so much commercial fertilisers would have been sold as had been the case.

An Inkerman delegate believed that a number of wheatgrowers had used manures and machinery earlier than they otherwise would have done on account of the visits paid to them by agents. If they passed a resolution as proposed they would be interfering with the liberty of the subject.

The motion was lost by a large majority.

THE RABBIT PEST.

Mr. G. Stone (Port Germein) did not think there was a more important matter on the notice-paper for discussion that night than the rabbit pest. Unless something more was done to check these vermin, he thought they would have to leave the country. It cost him a large sum annually to keep them in check. Some years ago a French chemist made an attempt to introduce a disease among rabbits, but before he had an opportunity of proving the efficacy of his method of treatment he, unfortunately, died. A substantial sum should be offered by this State, or the States, for some very effective means of destroying the rabbits. The carrying capacity of their lands, he thought, had been seriously reduced, and the cost of attempting to eradicate the pest in the ordinary way would be something enormous. It might be argued that it would not be the right thing to ask the Government to place a sum on the Estimates for the purpose of keeping rabbits in check, but he thought they might reasonably request the payment of a bonus for a satisfactory method of dealing with the pest, the money not to be paid until everything had proved satisfactory. He moved:—"That the Government be requested to offer a substantial bonus for some effective method of destroying rabbits at a reasonable cost."

Mr. Kennedy seconded the motion. The seriousness of the trouble was only known to those who lived in the outside districts, where, in many cases, there were no crops at all in consequence of the ravages of the rabbits. Many people wanted to know if a contagious disease could not be found to destroy the pest, but the question was: Where would such a disease stop? It might spread to other animals, or even human beings.

Mr. W. G. Mills (Kamnatoo) said he endorsed the remarks of Mr. Stone. He held 4,000 acres, and had killed 5,000 rabbits in a year; but he could never get rid of them until he wire-netted his property.

Mr. F. G. Ayres (Meningie) said the New South Wales Government had offered a very large bonus some years ago for an effective method of destroying the pest. A French expert had proposed inoculation with chicken pox, but they would not have it, because it was feared that poultry and other birds would take the disease. Great care should be taken before the introduction of any disease.

Mr. J. A. Lock (Whyte-Yarcowie) said a long experience had led him to the conclusion that if they were going to fight the rabbit properly they would have to wire-net their properties. If they had a large number of rabbits, a good way to destroy them was by means of phosphorus and pollard. The mixture would kill them in thousands, and the rabbits would eat it at any time of the year. They would have to exercise care in not leaving phosphorus lying about, or sheep and other stock would be poisoned.

Mr. Preiss (Mannum) said that on the eastern side of the Murray the rabbits were swarming over the country, but he was keeping the pest down well. No disease would kill every rabbit in the country, and the only remedy was for the farmers to kill them themselves. Keep them down low, and stick to the work. Then they would be able to cope with the pest all right. He laid baits of poisoned jam or of phosphorus.

A delegate considered that farmers should assist their District Councils to enforce the Act. They should all take action on a certain day, or days, to kill rabbits. Unless they all combined and took simultaneous action, the pest could not be kept in check.

Mr. A. C. Hirsch (Hawker) considered that after twenty years' experience South Australians knew but little about this question. The only method by which the State would get over the difficulty would be by allowing all the District Councils to form themselves into Boards, in the same way as the Vermin Boards had been appointed. The Councils should wire-net their districts in, and then the residents would be able to kill the pest.

Mr. J. Miller said his farm was in a vermin district, and some of his neighbours could not grow a crop because of the rabbits. If those neighbours had honestly supported the District Council the rabbits would have been got rid of by now. The Commissioner of Crown Lands had told him that the Vermin Destruction Act was in the hands of the District Councils, and that the Government would not take any action in the matter.

The motion was lost by a large majority.

FARMERS' DAY AT AGRICULTURAL COLLEGE.

Mr. F. G. Ayres (Meningie) moved:—"That the day for visiting the Roseworthy Agricultural College be altered from the Monday after show week to the Tuesday before the show." He said that a number of members of the Bureau who would like to visit the College were unable to do so, as they could not break into another week in town. If they had visited the College this year before the show they would have been able to have taken greater interest in the address Professor Perkins was going to deliver to them.

The motion having been seconded, Mr. Hirsch (Hawker) submitted an amendment to the effect that the present arrangement should not be altered.

Mr. J. Brewster (Quorn) said that the North train leaving Hawker on Monday did not reach Adelaide till Tuesday evening, and if the proposed suggestion were carried out a number of the members of the northern Branches would be unable to visit the College.

Mr. J. G. Folland (Reeves Plains) stated that a great many were unable to visit the College on a Monday, and the same thing applied in respect to the Tuesday before the show. Therefore he thought an alternative arrangement in respect to the days should prove satisfactory. They would never be able to fix upon a day that would suit everybody.

Mr. R. Caldwell questioned if farmers gained much knowledge from these "wholesale visits." He thought it would be a better plan to allow farmers who were desirous of inspecting the College to visit it at another time rather than that they should all visit it at once. Professor Perkins could not give much information to such a large body of men on visiting day, as all wanted to ask questions at the same time.

Mr. W. L. Summers pointed out that as Bureau members travelling on official business could obtain return railway tickets at excursion fares, it would be a good plan if two or more Branches in any locality decided to make a special trip to Roseworthy. It would, of course, be necessary to make arrangements with the College authorities beforehand, but he was certain that Professor Perkins would always be glad to welcome them, and would give them all the information in his power. If this were done, the Hon. Secretaries of the Branches proposing to make the trip would need to apply to him (Mr. Summers) for certificates of membership, which would be required by the railway stationmasters before they could issue tickets on the terms mentioned.

A delegate thought it would be a pity to abolish the present visiting day, although he also approved of the other suggestion.

The Chairman said the present arrangement could be allowed to remain, and in addition small parties could doubtless go to the institution when it was convenient.

Mr. Caldwell moved as a further amendment:—"That the Minister be asked to provide facilities to enable farmers to visit the Roseworthy Agricultural College at any time, on reasonable notice being given." Mr. Caldwell's amendment was carried unanimously.

THE SIZE OF WHEATSACKS.

Mr. Fraser (Inkerman) moved:—"That no alteration in the present size of wheatsacks is desirable." He said he had noticed that in New South Wales it had been proposed to alter the size of the sacks, and it was just as well that an expression of opinion on the subject should be recorded.

Mr. Brown seconded the motion, which was carried, only three delegates voting against it.

SHOULD FARMERS KEEP PROPER ACCOUNT BOOKS.

Mr. J. Malcolm (Kadina) said the keeping of account books on the farm was more important than many imagined. In these days, when income tax returns had to be made out, there was some wisdom in keeping books, but many farmers neglected this important part of their business. The books should record the receipts and expenditures. There should be a stock book. At present the bank book was the only one the majority of farmers could produce, and in case of a dispute with income tax officials they would find themselves involved in a lot of trouble. He moved:—"That it is desirable that books of accounts of receipts and expenditures should be kept on the farm."

Mr. R. Thompson (Quorn) seconded the motion. Farmers should take a lesson from business men in this matter. He had got a book, and always kept one; if he had not he would have been in the Insolvency Court long ago. If he had not kept a book he would not have known what had paid on the farm and what not. They should keep an account of what the fowls and cows were doing. In that way they would be enabled to keep only those things on the farm that paid.

Mr. Caldwell said he failed to see what good would result from the passing of such a resolution.

Mr. F. Coleman (Saddleworth) supported the motion, because he believed that the books would prove of considerable help, especially in regard to the making out of the income tax returns.

Mr. A. L. McEwin (Brinkworth) considered the motion practically a libel on farmers. He did not think there was a member of the Bureau who could not tell his exact position in fifteen minutes. His experience of farmers was that they were correct to the penny in all transactions. Of all men with whom he had dealings he had had the least trouble with the farmers.

Mr. Fraser (Inkerman) believed that there was hardly one in twenty farmers who adopted a systematic method of bookkeeping.

Mr. Challenger thought that the passing of the motion would be as much as to say farmers were ignorant.

The motion was carried by a large majority.

FLAT-BONED HORSES.

Mr. A. Maslin (Wilmington) said he wished to ask why flat-boned horses were supposed to be superior to round-boned animals. If any delegate could tell him he would be pleased for the information. It was quite clear that there was some superiority, as buyers had been known to refuse to buy round-boned horses.

A delegate said this was a question for a veterinary surgeon. Mr. Maslin could find something about the subject in Lieutenant Fitzgerald's book on the horse. The speaker said he had always looked upon round-boned horses as not good to breed from.

Mr. Brown said that one of the best horses he had ever seen was a round-boned animal.

NOXIOUS WEEDS ACT.

Mr. A. L. McEwin (Brinkworth) said the District Councils had recently received notice that two or three different weeds had been added to the Noxious Weeds Act. He wanted to know what good it was proclaiming these weeds, seeing that there were thousands upon thousands of acres covered with weeds, and practically nothing was done to destroy them. It was a farce. A manager of a station had told him that although they had more star thistles than ever, they had more sheep on the run.

Mr. R. Caldwell said he believed the reason the Government did not enforce the Noxious Weeds Act was because along the railway lines all kinds of noxious weeds were growing.

Mr. W. T. Cooper (Koolunga) said the Government should keep their own land clean. On the Murray Flats star thistles were growing as high as the trap wheels.

Mr. Challenger wanted to know if the Government were liable for not destroying noxious weeds, as well as individuals. (Cries of "No.") Well, then, they had no remedy.

A delegate said it was proposed that each district should declare what was a noxious weed.

Mr. Summers—The Municipal Corporations already have that power.

Thursday Morning, September 8.

Mr. J. Miller occupied the chair.

EXPERIMENTAL CULTIVATION.

Professor Perkins gave an address on this subject, illustrated by means of lantern views. A report will appear in November issue.

Thursday Evening, September 8.

STANDARD WEIGHT OF WHEAT.

Colonel Rowell occupied the chair, and said that three representatives of the Corn Trade Section of the Adelaide Chamber of Commerce, namely, Messrs. A. P. Hall (Chairman), J. Darling, M.P., and C. H. T. Connor, attended by invitation to discuss the question of the fixing of the standard bushel of wheat with the delegates to Congress.

Mr. Hall, in addressing the meeting on the subject, said he would simply make a statement of facts, and then a discussion could follow. When the quantity of wheat grown in South Australia became more than enough to supply the local demand it became necessary to export it. It also became

imperative that a standard should be fixed so that dealings could be carried on with traders living in other parts of the world. The Corn Trade Section of the Adelaide Chamber of Commerce had fixed the standard for South Australia ever since 1888. On looking through the records of the Chamber he saw that the dates on which the standard had been fixed had varied considerably. It was as late as February 14 on one occasion, and the earliest date was on December 15, which occurred the year before the present. The reason for fixing the standard was for the benefit of the farmer as well as for the miller or wheat agent. The wheatgrower bargained for the price of his cereals, received his cheque, and there his transaction ended. With the shipper the transaction was much different. He had a great deal of responsibility until his cargo was delivered on the other side of the world. If the wheat turned out to be short in weight he had to pay for the shortage, and if it did not come up to the average he was also called upon to make payment. If on the arrival of wheat at oversea ports a dispute arose as to the quality of the wheat umpires were appointed, and they secured one of the samples that had been forwarded to that country as soon as possible after the Corn Trade Section had fixed the standard sample. If the wheat on board did not come up to the sample fixed by the Chamber, then the shipper had to suffer. The Adelaide Corn Trade Section obtained samples of wheat grown in the State as early as possible in the season each year, sending out notices, which stated that samples were required, to millers, the Farmers' Union, and the Agricultural Bureau. On receiving the samples they were mixed, and a fair average bushel was struck and weighed. Then it became a question as to what should be the standard for the year. The weight of this sample was not accepted in its entirety; but the Chamber tried to make everything satisfactory, as they did not want any disputes over cargoes that might be sold. The standard fixed was usually slightly under the actual weight of this sample. Much comment had taken place of late years as to the date upon which the standard had been fixed. The standard weight had been 64 lb. in 1888 and again 64 lb. in 1891. With those exceptions it had been from 62 lb. to 63 lb. until last year, when it was fixed at 61½ lb. He had just told them why the standard was fixed and how, and he would leave it to the other speakers to deal further with the subject.

Mr. G. Teagle (Kapunda) wanted to know why previous to 1888 South Australian wheatgrowers were able to get 1s. 8d. per quarter more for their wheat than they were since the Chamber of Commerce had fixed the standard. It was outside the rules of the Chamber of Commerce to fix a standard for the whole of South Australia. The buyer was at liberty to dock the wheat if it were below the standard, to the extent of double the amount he paid for it. He had known instances where wheat had been docked 1d. per bushel because it did not go up to the standard, while, when it went above the standard, only ½d. per bushel extra was given for it.

Mr. Hall replied that so far as the Chamber of Commerce was concerned it had nothing to do with the prices paid for wheat, or the docking of it because it did not come up to the standard. The Chamber simply fixed the standard, so that the wheat might be sold in another country. The price was a matter for the individual buyer and seller.

Mr J. C. Symons (Crystal Brook) said the members of the Chamber of Commerce were buyers of wheat. Therefore, the opinion was, they had an influence on the price. He thought the right persons were not fixing the standard bushel, for this reason—that all those who took part in the fixing of the standard were interested in the buying and not the selling of the wheat in the State. In a paper he had read at a meeting of the Crystal Brook Branch he had suggested that the Principal of the Roseworthy Agricultural College should be chairman of the body that fixed the standard weight, which should consist of representatives of the Council of Agriculture and members of the Corn Trade Section. Farmers in the Crystal Brook district considered that they had suffered greatly through the standard being fixed so late last year. They commenced last year by selling their wheat at the 63-lb. standard, and had delivered two-thirds of it when the standard was announced to be down to 61½ lb. He had calculated that farmers around Crystal Brook had lost £500 through this. He moved:—"That the standard be fixed at 62 lb. for all time."

Mr. Harris (Mundoora) seconded the motion.

Mr. G. Teagle (Kapunda) said he had received 33 letters asking him to stick to a fixed 60-lb. standard. (Cries of "No"; and "We do not want that.")

Mr. Hirsch (Hawker) thought that farmers should have a say in the fixing of the standard. They should have representatives on the grain trade section of the Chamber of Commerce.

The Chairman said if there were a fixed standard, as proposed, the farmers would have no need for such representatives. But he did not know what the result would be—what the buyers in England were going to do.

Mr. W. G. Mills (Kammantoo) considered that there was no need for them to trouble about a standard at all. If wheat went below a certain quality, say 60 lb. to the bushel, then the buyer could dock it; but if it went above that, he should pay at the same rate as when a reduction was made.

Mr. A. L. McEwin (Brinkworth) said they approached the Chamber of Commerce in an altogether wrong spirit over this matter. The farmers were in the position of sellers, and they could not dictate to the Chamber of Commerce and the wheatbuyers. He was in sympathy with the motion, and would support it. He was pleased that the Chamber of Commerce had sent representatives there that night to discuss the matter with them. It was to be hoped that the difficulty would be amicably overcome. He did not think the small measures for weighing the wheat were always correct, and he mentioned an incident when his wheat was said to be of less weight than it was. He, however, produced his own bushel measure to test it, and the trouble ended at once. Competition among the buyers themselves, when there was a tiptop wheat and a high standard, would make matters all right. Last harvest some of the growers had got the whole of their wheat delivered under the 63-lb. standard before that of 61½ lb. was declared; but buyers might turn round and say they had given 3s. 1d. per bushel for the early wheat. He would far rather see buyers make than lose money, as, if they lost on their business, it was bound to react to the injury of the farmer.

Mr. J. Malcolm (Kadina) said it was evident from the remarks that the delegates were of the opinion that the Bureau should approach the Chamber of Commerce, and ask that the farmers might be represented on the Chamber, for the purpose of fixing the standard at as early a date as possible.

Mr. Thomas moved as an amendment: "That the present method of fixing the standard is unsatisfactory to the farmers of South Australia." He thought that they should not decide to take any definite step which they might regret afterwards. If the amendment were carried committees could be appointed to make further enquiries upon the subject. South Australia used to grow the best wheat in the world, and probably did so now. He had been told that some wheatbuyers did not approve of the small wheat measures at present in use in the State. Perhaps some of the wheatbuyers present might enlighten them upon that point.

Mr. G. Teagle (Kapunda) seconded the amendment.

Mr. F. McMartin (Booleroo Centre) thought that no farmer wished the standard fixed at 60 lb. per bushel. He had been buying wheat for 17 years, and if the standard were as low as 58 lb. they would find some growers bringing along wheat at 57½ lb.—that was, if they had enough rubbish to make it at that. Anything under 62 lb. was not a fair average sample of wheat that could be grown in South Australia. The higher they made the standard the better it would be for the farmers. (Hear, hear.) The alteration he considered necessary was the fixing of the standard bushel earlier in the season, and on no account should the standard be less than 62 lb. to the bushel.

Mr. J. A. Lock (Whyte-Yarcowie) believed that the delegates, if they were not careful, would get into a fog on the subject. To his mind, they should do one of two things—either favour fixing the standard for all time at 62 lb. per bushel, or pass a resolution setting forth that representatives of the Farmers' Union and the Agricultural Council should be members of the Corn Trade Section of the Chamber of Commerce.

Mr. J. Darling—Members of the Farmers' Union are now upon the committee.

Mr. J. Miller said the delegates to Congress could congratulate themselves upon the representatives of the Chamber of Commerce meeting them that night. It showed that they believed in the system they administered.

It was the duty of the delegates to say in what direction reforms were needed. The standard sample could not be fixed sufficiently early to say it was a fair average quality wheat of the State. They could not have a fair average sample simply to do business with the early districts. Every year they had some excellent wheat and some very inferior lots. Wheat was not ripe enough for reaping in various parts of the country until a lot of it had been marketed from other parts. The quality varied every year from good to bad. It was undesirable to fix a standard for all time, and therefore he would oppose Mr. Symons' motion.

Mr. Badman (Riverton) said that the higher they kept the standard the better would be the quality of the wheat sent to England, and the greater would be their reputation.

Mr. F. Coleman (Saddleworth) said he would like to know whether it was practicable to have a standard fixed for a number of years, and would like to hear what the representatives of the Chamber of Commerce had to say on the matter.

Mr. J. Darling addressed the Congress. He said he had been taking part in the wheat trade since 1866. He would tell them why they should fix the standard each year on its merits. The Chamber of Commerce had never been in conflict with the members of the Agricultural Bureau, nor had ever desired to fix the standard either too high or too low. Yet some of the farmers had seen fit to say so. The Chamber fixed the standard as a trade standard for commercial men trading in South Australia and beyond its shores. If they wanted to do the best for our farmers they would keep the standard as high as they consistently could. Supposing they had seven-tenths of their crop going 63 lb. to the bushel, would they like to have the standard fixed at 62 lb.? They would have to send to the markets of the world a 62 lb. standard, while seven-tenths of the crop was going 63 lb. As a trader it would suit him remarkably well; as a grower, he would say: "Do not do anything of the sort, but keep your standard as high as you possibly can." South Australia would then command a preference for her wheat in the markets of the world. If the wheatgrowers were to supply 63 lb. wheat the standard being fixed at 62 lb., he could tell them that then they would not get the full value for their produce. What would happen would be this the buyer would purchase the 63 lb. of wheat on the 62 lb. standard, and would ship a 62 lb. standard to the other side of the world, and would give the farmers only a corresponding price. (Laughter.) The Canadian and Argentine standards were now 64 lb., and if they reduced theirs to 60 lb. they would declare South Australian wheat inferior. If there were a 62-lb. standard, when seven-tenths of the wheat really went 63 lb., who was going to get the advantage? Why, the traders on the other side of the world, if the traders here did not take another course. They might buy wheat on the fixed standard of 62 lb., with a crop averaging 63 lb. or 64 lb., which they would sell in Europe as "choice" at higher than ordinary rates, and put money in their own pockets which the farmers should have had. That would possibly be one thing they would have to face, and he would have no objection to it. (Laughter.) But he would say it would be in the best interests of the producer to fix the standard weight of wheat every season upon its own merits, and the growers would get full value for the article they sold. That was the wisest course to pursue. If they had wheat not going more than 60 lb. to the bushel, did they think millers in England were going to buy it when plenty at 64 lb. was offering from Canada and other parts?

A Delegate.—It has never been so low as 60 lb.

Mr. Darling said the delegate from the Kapunda Branch had told them that evening that he had received 33 letters congratulating them upon their successful movement with the object of getting a fixed standard of 60 lb. If they did that they would be crying stinking fish upon their own wheat. When at Jamestown recently, Senator McGregor implied that the wheat-buyers were practically a lot of rogues, and said they were robbing the farmers. Mr. Darling said he had been among the farmers for 40 years, and had found that they were well able to take care of themselves. They were an exceedingly intelligent body of men. To the wheatbuyers it seemed strange that whenever there was a fall in the wheat market the farmers got immediate scent of it. Too often they only heard one side of a question, and this referred particularly to early sellers of wheat last season. Those who got their wheat in early were the most favoured farmers in the

State. They were situated in a part where, owing to climatic conditions, they were able to bring in their crops long before other crops were reaped. As there was a temporary shortage in the Australian supply, they obtained several pence per bushel for their wheat above European parity. Instead of the farmers in the Crystal Brook district losing £500, as had been represented, it was the traders and shippers who sustained a loss. The unfortunate traders bought the wheat in anticipation of the Victorian mills requiring supplies for an early start; but they were out of pocket over the transaction, as they found that prices here were not in parity with the London market. Those farmers had no need to complain, but should congratulate themselves upon having done remarkably well. (Laughter.) Farmers knew very well that buyers always bought and paid for 60 lb. of wheat to the bushel, and that the standard fixed each year was merely an indication of the quality of the wheat. A number of people had discussed the question as to whether there should be two standards. If the farmers adopted such a suggestion they would be playing right into the hands of the traders. Traders must have some standard, so that they can say to the markets of the world they could guarantee up to that standard. In this telegraphic age practically all business was regulated by the standard. He thought they could not improve upon the lines they had been working upon for the last 40 years, and such lines had brought South Australia into good repute. The South Australian standard of late had been higher than that of Victoria and of New South Wales. Owing to the damage done by summer rains the South Australian standard was fixed at 61½ lb. Victoria then fixed hers at 60½ lb., and New South Wales decided upon a 61-lb. standard. What was the result? It was this. Their people cabled out: "We want Australian wheat, and will give 3d. per quarter preference for South Australian shipment." Owing to heavy rains, which occurred last season after the standard was fixed, shippers had experienced difficulty in making their cargoes go up to 61½ lb. per bushel, and, unfortunately, were called upon by arbitration to make good some losses. Owing to the lower standard, Victorian dealers had not suffered to the same extent: but they had kept South Australia ahead, and she would have preference next year, through having maintained a higher standard. Some few years ago the Victorian standard was 1 lb. more than that here, and her shipments then commanded 3d. per quarter more than South Australian wheat. Were they, under such circumstances, going to fix an arbitrary standard, and give the other States an opportunity to command higher prices in the markets of the world? He was sure the Corn Trade Section of the Chamber of Commerce would be pleased to have gentlemen representing the farmers joining with them in their deliberations when the standard for each season was fixed. A standard sample that would compare with the wheat of the season was what was essential. Then it could be sold on sample. The existence of the wheatbuyers depended upon the wheat-growers, and in the same way the existence of the grower depended upon the buyer. They must go together hand in hand. (Cheers.)

A delegate wanted to know why the buyers did not give so much for wheat over the standard as they took off for wheat under it.

Mr. Darling said that with wheat over or under standard the farmer had to make a special contract with the buyer, as it was not f.a.q. wheat, and the farmer with wheat over standard should endeavour to make special terms with the wheat merchant or miller. If they did not protect themselves in this way, they could hardly expect the buyers to act as philanthropists. The farmer who had a sample which he thought was worth a higher price than ordinary need not sell it under its value.

Mr. Gregory stated that he was surprised the Farmers' Union had not sent their representative on the Chamber of Commerce to that night's meeting.

Mr. Darling explained that the reason was that it was the occasion of the annual meeting of the Farmers' Union.

Mr. J. C. Symons (Crystal Brook) said after the statement of Mr. Darling in regard to the reason for fixing the standard each season he would withdraw his motion.

The Chairman said that the amendment setting forth that the fixing of the standard was unsatisfactory to the farmers of South Australia became the motion.

Mr. R. Caldwell wanted to move as an amendment: — "That in the opinion of this Congress, after having heard the statement of the Corn Trade Section of the Chamber of Commerce, it would be detrimental to the interests of wheatgrowers in the State if any alteration were made in the fixing of the standard"; but the Chairman would not accept this, as it was a direct negative of the motion.

Mr. Darling was asked if wheat was worth more in Victoria than in South Australia. He replied that that depended upon various circumstances which had to be taken into consideration. Freights had an important bearing on the markets. At present they were 1s. per ton less from South Australia, but there were very limited offerings of wheat here. In Victoria there were fairly free supplies yet. In South Australia the trade in wheat at present was almost at a standstill because the greater portion of the crops had passed away to the markets of the world.

Mr. R. Thompson (Quorn) said the Branch Bureau he represented had carried a resolution declaring that the present system of docking wheat under the standard was unfair. It was thought that the docking should be done by weight and not by pence.

Mr. Darling replied that the Chamber of Commerce had nothing to do with the docking of wheat. It was purely a matter between the individual grower and the individual trader.

The motion was then put, and was lost by a large majority.

Mr. A. L. McEwin (Brinkworth) moved:—"That this Congress accepts the offer of representation on the Chamber of Commerce for the fixing of the standard sample of wheat, and that the Council of Agriculture make necessary arrangements to give effect to it."

Mr. J. C. Symons (Crystal Brook) seconded the motion, which was carried.

Mr. R. Caldwell moved that a vote of thanks be tendered to the representatives of the Chamber of Commerce.

Mr. R. Thompson (Quorn), in seconding it, said it was a pity the gentlemen from the Chamber of Commerce did not meet the delegates to Congress oftener. (Hear, hear.)

The motion was carried.

PRESENTATION TO MR. R. MARSHALL.

The Chairman said he was very pleased to see that the farmers of South Australia had thought fit, through the Agricultural Bureau, to show their appreciation of Mr. Marshall's services to the residents of the State by presenting him with an address. Doubtless they recognised what beneficial results had accrued to the farmers through Mr. Marshall's labours in the cross-fertilisation of wheats. The trouble with the red rust had to a large extent been overcome by the introduction of these rust-resistant varieties of wheat. On behalf of the members of the Agricultural Bureau and the farmers of South Australia, he had much pleasure in handing the address to Mr. Marshall, which was signed by the members of the Council of Agriculture. The address was as follows:—

"We, the undersigned, desire to express our appreciation of the important service you have rendered to South Australia in securing, at your own cost, varieties of wheat that will, as proved by actual test, resist the attacks of red rust without impairing productiveness, whether for grain or hay, or injury to milling qualities. We congratulate you upon the success that has attended your efforts, and assure you that you have laid the farmers of this State under lasting obligation, the knowledge gained by you having made their operations safer and more profitable, particularly since the use of commercial fertilisers has become general. It is impossible to estimate the monetary value of your work, but we are confident that not only farmers but all classes of the community have derived substantial advantage from the important discoveries made by you. We cannot too highly emphasise our appreciation of the fact that you have not withheld the information gained from experiments extending over many years, but have allowed the public to participate in your success. Red rust and other diseases so prevalent in Australia have often resulted in the loss of the greater part of the wheat crop, but you have been one of the first to demonstrate the possibility of producing

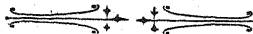
varieties of wheat that are almost, if not absolutely, proof against these attacks, thus providing one of the most valuable object lessons that could be offered to the farmers of the Commonwealth. We therefore desire to record our sincere appreciation of the good work which you have done, and assure you that in our opinion you have been a benefactor to the whole community, and especially to those who are directly dependent upon agriculture. We hope you may be spared for many years to enjoy the satisfaction of witnessing the continuance of the prosperity that you have been so instrumental in helping to bring about. On behalf of the Agricultural Bureau and farmers of South Australia."

Mr. Marshall said he wished to sincerely thank all those who had presented him with the testimonial. As long ago as 1866 he began gathering information about the wheat plant and securing new varieties for the purpose of growing them side by side to discover and select the best—those with good milling qualities, but yet able to resist rust. His ambition was to produce a wheat that would command the highest price in the world, and he believed if he had had the opportunity to carry the work out as it should be done he would have been able to have obtained such a variety. He was pleased to know that the Government were going to take up the matter of improving the wheats in the State.

A comprehensive vote of thanks to those who had taken part and to the Chairman concluded the Congress.

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VII. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.



AGRICULTURAL BUREAU REPORTS.

Gladstone, August 6.

PRESENT—Messrs. Goode (chair), Rundle, Goodes, Gallasch, Greig, Brayley, Sargent, and Wornum (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Resolution passed at previous meeting in favour of Kapunda proposal for a fixed standard of 60 lb. per bushel was rescinded. The Chairman read a paper on the standard bushel. Speaking generally, he thought that, although many people had a tendency to speak of farmers as a discontented lot, the only sore point between the farmer and the merchants was in connection with the sale of wheat. Their wool, live stock, and various minor products were disposed of without leaving that feeling of unfairness so generally felt in connection with the sale of wheat. The points of difference between farmer and wheatbuyer were:—1. The f.a.q. standard is fixed much too late in the season. 2. The measures used by agents were too small and the methods of filling the measures too varied to accurately determine the weight of a sample of wheat. 3. That while buyers dock all wheat under standard they give nothing extra for wheat weighing more than the standard. The farmers in the earlier districts suffer most from the delay in fixing the standard, as too often they are forced to sell their wheat under the previous year's standard as soon as harvested, and frequently are docked for wheat that would reach the standard fixed later on. A permanent standard would certainly get over this difficulty, and it appeared to him that this was the strongest argument in favour of a fixed standard. He could not, however, see why the merchant could not refund any deductions made under such circumstances. For instance, a farmer with 500 bags of wheat, weighing 61½ lb., sells under the previous season's standard of 63 lb., and is docked 1½d. per bushel, equal to £12 10s. on the parcel. Later on the standard is reduced to 61½ lb., at which the wheat would have received full market rates. Why, therefore, should not the merchant refund the amount of £12 10s. to the farmer? It might be said, on the other hand, that the next year the early districts would sell under the lower standard, which might be raised when the standard for the season was fixed, and so escape docking. They must not, however, forget that it is the farmer who is forced to sell who must accept the price offered, and the merchant covers this risk if possible. While they would admit that this was justified, they also thought it was no more than just to refund any amount docked under the conditions illustrated above. Apart from a permanent standard, which seemed open to many objections, he saw no other solution of the trouble arising from the late fixing of the standard. Dealing with the wheatbuyers' measures, a uniform method of filling and weighing should be prescribed by law. One of the members of the Branch submitted a sample to four different agents, and got a different weight from each, viz., 61 lb., 62 lb., 62½ lb., and 64 lb. per bushel. The measures used are so small that a very few grains will make a marked difference in the calculations, and unless it could be shown that a uniform method of filling would give accurate results, a measure of greater capacity should be used. A thorough test should be undertaken to determine whether the measures generally used were reliable or not. The sorest point of all with farmers was the question of docking. Any unbiassed mind will recognise the justice of the claim of the farmers for fair treatment in this matter. The merchants fix the standard of fair average quality wheat of the particular season at 63 lb. per bushel, and wheat going only 61 lb. is docked 2d. per bushel, though the market price is equal to only ½d. per lb. One would reasonably expect, therefore, that wheat weighing 65 lb. was worth 2d. per bushel above market rates, but the merchant refuses to pay it. The so-called f.a.q. standard is practically a minimum, and not an average standard at all. Various proposals have been brought forward to remove this injustice, including the Kapunda proposal for a fixed legal standard of 60 lb. Such a proposal, if carried into effect, would do more harm than good, as their aim must be to keep the produce of the State up to the highest possible level. To reduce the standard to 60 lb. would be the reverse, and would at once react to their disadvantage. Was it likely that operators would quote as much for shipments of 60-lb. wheat as for 61½-lb. or 63-lb. wheat? Could they imagine, either, that their merchants would give as much for such wheat? It may be said that a reduction in the standard would not lead to a reduction in the quality of their wheat, but he main-

tained that the tendency would undoubtedly be in that direction. Under present conditions, there was little or no encouragement to clean their wheat thoroughly, and farmers, like others, were hardly likely to expend labour in bringing their wheat to a high degree of quality if no corresponding recompense was forthcoming. They would get all the discredit of a 60-lb. standard from the first, and it would only be a question of time when they would merit all the discredit they got. In connection with this question there was one point upon which the Department of Agriculture might be able to throw some light, and that was the relative inferiority by actual milling tests of a 58-lb. or 60-lb. sample, compared with a 63-lb. or a 65-lb. sample. In addition, the relative values of bleached and unbleached wheats might be determined. He considered the whole matter an economic and not a political question, and to economic reform and not to legislative action must they look for a permanent solution of the present trouble. Considerable discussion ensued, and it was resolved:—1. That this Branch, while sympathising with the object of the Kapunda Branch, believes that the adoption of a 60-lb. standard would discredit their wheat in the London market. 2. That legislative action should be taken to ensure the adoption of a uniform method of weighing samples of wheat."

MILLING QUALITIES OF WHEAT.—This Branch supports Mr. R. Marshall's proposal that the Government should carry out milling tests of wheats, at the cost of the State except where the work was done for individual growers.

FEEDING DOWN WHEAT CROPS.—Several members consider it advisable to feed down the crops with sheep to ensure a more even growth, especially, where the crop is to be cut for hay and fed to horses as long hay.

Johnsburg, August 20.

PRESENT—Messrs. Masters (chair), Potter, Hombsch, Dunn, Chalmers, Johnson (Hon. Sec.), and two visitors.

EGG-LAYING COMPETITION.—Mr. Hombsch regretted that the Agricultural Society had determined not to sell eggs from the Roseworthy competition for breeding purposes. The absence of roosters from the pen simply reduced the competition to a trial between certain birds, whereas, without interfering with the test in any way, the Society could have given farmers the opportunity of improving their fowls at a reasonable cost. The prices charged by most poultry breeders for sittings of eggs were too high.

HORSE COMPLAINT.—Mr. Hombsch reported loss of two horses from some complaint which filled them with wind and gas. The animals were previously in good condition. Mr. Dunn found that for windy spasms 10 to 15 drops of colocynthis was usually an effective remedy. The dose should be repeated if relief is not obtained, and in very severe cases increased to 20 drops. If this treatment failed he would give 20 drops of nux vomica.

ROCK PHOSPHATES.—In reply to question, it was stated that several samples of rock phosphates had been found in the district, but of too poor quality to be of any value.

Gumeracha, August 22.

PRESENT—Messrs. Monfries (chair), Norsworthy, Bond, Hanna, Jamieson, and Martin (Hon. Sec.), and one visitor.

THE DISTRIBUTION OF FRUIT.—A paper on this subject was read by a fruitgrower. He believed if better means of distribution were adopted they could consume locally all the fruit grown in the State, as it did not represent a large amount per head of population. With the exception of the railway routes, the means of conveying fruit to various townships were very poor, and the consumption in country districts is consequently small. It is this that has led to the necessity for exporting their fruit. The extension of the export market will need the careful attention of the growers and exporters, and he believed much could be done at small expense if a proper scheme for pushing South Australian fruit in the principal cities of Europe were adopted. He thought that the growers and exporters could devise a satisfactory scheme, which, with a

little help from the Government, would prove of great assistance to the industry. The high prices necessary to return a profit on fruit shipped to Europe limited its consumption to the wealthy classes, and his idea would be to appoint a managing agent to canvass the larger fruiterers and buyers in the principal cities of Europe, and interest them in South Australian fruit, endeavouring, if possible, to secure advance orders. Such an agent could make all necessary arrangements for time and place of delivery of the fruit, and also arrange with selling brokers to dispose of fruit not ordered in advance. It would require an agency at the chief seaport of each country, to work with the manager of the Government Depot, and to keep in touch with local purchasers. Such a scheme would probably necessitate regulations in regard to quality, grading, and packing. It would require Government assistance to start with, but would soon become self-supporting. Every effort should be made by the Government to instruct growers in the methods to be adopted to secure the best results, not only in the export of fruit, but also on matters of cultivation, treatment of pests, etc.

Cradock, August 27.

PRESENT—Messrs. Paterson (chair), Solly, Rodgers, Clarke, Gillick, Graham, Ruddock, Fitzgerald, Iredell, and Lindo (Hon. Sec.), and four visitors.

RABBIT SUPPRESSION.—The Hon. Secretary was pleased to notice that the local Council was taking steps to enforce the destruction of rabbits, as it was quite time a number of landowners were taught that they could not go on breeding rabbits on their land to the detriment of their neighbours. Mr. Ruddock appealed to members to support the Rabbit Inspectors in carrying out their duties by pointing out to them where they knew rabbits to exist. Mr. Paterson found that sulphur and kerosine placed on straw or old bagging forced into the burrows and then fired was very effective in destroying the rabbits if the entrances to the burrows were effectively sealed. Mr. Clarke favoured the use of bi-sulphide of carbon in the burrows, and sandalwood poisoned with strychnine for those outside. It was resolved to support the Hawker District Council in their endeavour to get the Act amended so that vermin-proof fences could be erected inside District Council boundaries, with the assistance of Government loans, as was done in the Vermin Board districts.

Arden Vale, August 22.

PRESENT—Messrs. Warren (chair), Eckert, Pearce, Fricker, W. and J. Williss, Klinberg, Miller, Rogers, and Hanneimann (Hon. Sec.), and three visitors.

SEPARATORS.—Mr. Eckert read a paper on this subject. He had often enquired whether a separator would pay on a farm where only two or three cows were kept, as he did not think it would. At the Adelaide Show of 1903 he was assured, however, that it would pay to get one, which he did, as the season was promising. Before he got thoroughly into the way of working the machine he formed the opinion that there was too much labour and time wasted in taking it to pieces and putting it together again after using it; but he was satisfied now that the machine well repaid him for all this labour, etc. They got better quality and keeping butter than under the old system; in the summer they also got more butter, as in the pans there was always the risk of the milk souring quickly, resulting in loss of cream. From six cows he had kept the house in groceries, etc., during the past summer. He considered the milk from the separator much better for pigs and calves, as they get it fresh and sweet. Messrs. Klinberg and Pearce both stated that they got a lot more butter, especially in the summer, by using the separator, than with the pan system. Mr. Pearce said that from seven cows, largely Jersey strains, on rather poor feed, he was making 60 lb. of butter per week. Mr. Williss stated that a friend largely engaged in dairying told him that his calves did not do so well on separator milk. Members were of opinion that the separator milk was necessarily much poorer than milk from the pan system, as the separator removed practically all the cream, but the great advan-

tage lay in the milk being fresh and sweet. Under either system, some care was necessary in feeding the milk to calves.

POULTRY.—Mr. Fricker initiated discussion on paper read at Davenport Branch by Mr. Rathbone. Considering the substantial nature of the improvements provided, he thought 4 per cent. depreciation sufficient. The egg yield of 130 was high for a large flock, and he doubted if the average price would reach 9d. per dozen. The Chairman thought the money required to run a poultry farm on the scale indicated would be better invested elsewhere. Members considered that every farmer should keep fowls: but, in the absence of a profitable overseas market, increased production of eggs and butter simply meant lower prices.

STANDARD BUSHEL.—The Chairman referred to arguments at Balaklava meeting, which induced the members to reverse their decision in favour of a 60-lb. sample. He considered the report of Bute Branch completely refuted these arguments in favour of a high standard. It was a pity they could not get more information on various matters arising out of this matter of the f.a.q. standard.

Gawler River, July 22.

PRESENT.—Messrs. A. M. Dawkins (chair), H. and F. Roediger, Spencer, H. Dawkins, Hillier, Winckel, and Bray (Hon. Sec.).

HONORARY MEMBERSHIP.—It was decided to establish an honorary membership in connection with the Branch, on the following conditions:—Only those who have been active members for five years to be eligible. Any member may apply for honorary membership, or be invited to accept the position. Honorary members will not be eligible to hold office, but may take part in all business brought forward.

SEPARATORS.—Mr. Winckel read a short paper on this subject. Most dairymen keeping even three or four cows now have a separator, and they find it one of the most useful machines ever introduced. It is surprising how the early prejudice against the separator and butter made from separator cream has died out, and the separator was now regarded as indispensable. The question of the best machine was often raised, but most dairymen like the one they are using, because they are familiar with it. Whatever kind may be used, certain points will always require looking to. The separator must be kept well oiled, and every few weeks the oil holes, etc., should be cleaned, to ensure that the oil reaches the bearings. A little kerosine may sometimes be used with advantage to clean the holes, but care must be taken to put oil in afterwards to force out the kerosine. Owing to inattention, some separators vibrate considerably, causing a lot of unnecessary wear and also unsatisfactory work. The separator bowl must be kept scrupulously clean; it should be washed after each separation, and carefully dried before being put away. Paper read at Wilmington Branch, and printed in August issue of *The Journal of Agriculture*, was also read. Members on the whole did not agree with the statement that calves fed on separator milk did better than calves fed on milk set under the old pan system, their experience generally being to the contrary. Mr. Hillier stated that he found hand-fed calves thrived much better than those allowed to drink from the bucket. It was agreed that a firm foundation for the separator was essential.

OFFICERS.—Messrs. A. M. Dawkins, H. Roediger, and C. Leak were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Denial Bay, August 27.

PRESENT.—Messrs. Smith (chair), Starling, Hoffrichter, Croker, Doyle, Dunnet, G. J. and W. O. Gale (Hon. Sec.), and one visitor.

SHEEP.—Mr. Dunnet read a paper on this subject. The farmer must first decide for what purpose he will keep sheep, i.e., for wool, mutton, or lambs for export. In this district the latter was out of the question, as they were too far from a shipping port. They must, therefore, confine their attention to growing wool and selling an annual draft of sheep from their flocks. The Merino appears to suit this district best, though he proposed experimenting

with the Shropshire cross, as, so long as mutton keeps up in price, they will be more profitable than the pure Merino, owing to maturing quicker. The difficulty with the beginner is to get good sheep of the type decided on, as to him there would be little difference in the outward appearance of different sheep, yet the quality of the wool alone may easily vary to the extent of 2d. to 3d. per lb. in value, besides the difference in yield. As the general run of their sheep was rather inferior, the beginner in this district was very likely to have to pay for his experience. The dingo was the greatest drawback to keeping sheep in this district, and but for that he would say it would pay every farmer to keep sheep. Sheep that are yarded do badly here, partly because the country is not good enough, and often because the shepherd has the same fault. In buying ewes to start the flock he would advise obtaining good-framed and strong-constituted sheep, at four to six tooth. The sires should be the very best that the farmer can afford, as a good start is a great factor in the success of the flock. On account of the long, dry summer he did not put the rams with the ewes until the middle of December, as in average seasons it was not safe to have the lambs dropped before the middle of May, by which time, however, they generally had sufficient young grass for the ewes. Sheep require plenty of food and water, and to be disturbed as little as possible when feeding. Over-stocking was the greatest mistake they could make. He thought they were justified in expecting to see mutton remain at a high level for some years, so that if they wanted cheap meat they must grow it themselves.

Petersburg, August 20.

PRESENT—Messrs. Cadzow (chair), Alford, Earle, Sambell, Philp, Bottrill, Nourse, and Wilson (Hon. Sec.), and one visitor.

BEST HORSE FOR FARM WORK.—Discussion on this subject took place. The Hon. Secretary said for this district a good upstanding horse, with fine points and good action, was most suited to their requirements. They stood the work on the soft, loose land much better than the heavy draught. How to breed such an animal he did not know, unless the cross of a blood horse on a draught mare would produce it. Mr. Bottrill favoured the class of horse referred to, but had known many animals bred as suggested turn out failures. He found the progeny of a light mare mated to a draught entire good and useful animals for their work. Mr. Sambell favoured the progeny of medium draught mares mated to pure Clydesdale stallions. Mr. Earle agreed. The Clydesdale progeny were hardy, good doers, and good tempered, as a rule. Members pointed out that in the North farmers often found it impossible to breed from the class of stallions they would like, as they could not afford to buy such a horse, and those travelling were often not up to requirements.

Strathalbyn, August 22.

PRESENT—Messrs. M. Rankine (chair), Fischer, W. Rankine, Cockburn, Butler, Reed, and Cheriton (Hon. Sec.), and visitors.

BLEACHED WHEAT.—Members regretted that this subject had not been placed on the agenda paper for Congress, as they considered it of so much importance to the farmers that it should be further discussed.

IMPROVEMENT OF PASTURES.—Paper read at previous meeting by the Hon. Secretary was discussed, and the views and suggestions of the writer met with general approval.

FALLOW CROPPING.—Mr. P. Cockburn read a paper on this subject. Fallow cropping was not carried on very largely in this district, but he felt sure more could be done in this respect, providing ample supplies of fodder for stock of all descriptions. Fallow cropping was good for the land, and he believed that the land so treated would remain in good heart longer than land that was treated as bare fallow. Fallow cropping ensures employment for the teams and men all the year round, which was a decided advantage. Rape was a splendid plant for sheep, and could be sown in February, or, in the case of fallow cropping, in July. Last February he drilled about 30 acres of stubble land with rape, and had a nice supply of really valuable feed

now in the paddocks. As the seed was cheap, and 2 lb. per acre was sufficient to sow in this way, the cost was very little. Peas were another crop that could be grown with profit on the fallow; for cleaning land that was oats it was very good. His experience with peas was that they were so beneficial to the land that the crop pays well, even if they got nothing more than the straw from it. If cut when the flower was just off and a few pods formed, it made ensilage that was unsurpassed in this district as a fodder for milk production. Maize was a good fodder, but he found he could not grow wheat after it, and had therefore given it up. While sorghum was not so good for cows as maize he found it paid well. It was not so hard on the land as maize. Last year his best hay crop came off land that carried sorghum the previous summer. Amber cane was the best variety he had grown, and for four years out of six he had had very good returns from it. He ploughed the land about 5 in. deep, allowed it to lie for a few days, then cultivated across, harrowed and rolled it, and sowed the seed with the ordinary field drill. If the land was clean the drills were 28 in. apart, but if horsehoeing was necessary they should be 36 in. wide. From 7 lb. to 12 lb. of seed per acre would be required. If wild oats or other weeds are seen in the young crop, sheep or cattle can be safely turned in, as they do not like the young sorghum, but will eat the weeds. [Care must be taken not to turn hungry stock on for this purpose, as if they eat any quantity of the young sorghum it will probably kill them.—Ed.] When the sorghum comes into flower stock of all kinds are very fond of it, and will eat up every stalk. Fowls were very fond of the seed. Sunflowers did very well with him, and made splendid feed for horses, giving them a good bright coat of hair. The seed was valuable as a poultry food. Cow peas and buck wheat had done no good with him, though he had tried them several times.

Co-OPERATION.—Representatives of the South Australian Farmers' Co-operative Union attended by invitation, and explained the aims and objects of the Union.

Dowlingville, July 29.

PRESENT.—Messrs. Illman (chair), Montgomery, Whittaker, Mason, Grave, Crowell, Foggo, Phelps, and Lock (Hon. Sec.).

GERMINATION OF WHEAT.—Some discussion took place on the irregular and patchy germination of some crops this year. In places in the same paddock the wheat has come up much better than in other places, though the same seed has been used. Some of the members were of opinion that deep drilling was responsible for some of the thin crops.

Bute, August 22.

PRESENT.—Messrs. A. Schroeter (chair), Barnes, Sharman, Stephens, H. Schroeter, and McCormack (Hon. Sec.), and one visitor.

SIZE OF WHEATSACKS.—The Hon. Secretary initiated a discussion on this subject. He did not consider the proposed reduction in the size of the sack at all desirable. A shorter or narrower bag would be clumsy, and would entail extra expense on the farmers. Other members agreed.

WOUNDS ON HORSES.—Members consider that all cuts of any size should be stitched as soon as possible after it was noticed. A little attention early would save a lot of trouble.

RABBITS.—Mr. Barnes considered that with a few good seasons the district would simply be overrun with rabbits, unless drastic measures were taken to deal with them. The increase of late in the numbers of the pest was amazing. It was resolved that this Branch is of opinion that steps should be taken immediately to deal with the rabbits, and that united action on the part of all landholders was necessary to effectively destroy them. Members were of opinion that the local Council should strictly enforce the vermin laws. Bi-sulphide of carbon, phosphorised pollard, and other poisons were suggested where it was not intended to make use of the rabbit. Mr. Barnes explained the working of a trap he was using with satisfactory results.

Naracoorte, August 13.

PRESENT—Messrs. Forster (chair), Wardle, McKay, Williams, Attiwill, Caldwell, and Schinckel (Hon. Sec.), and two visitors.

STANDARD BUSHEL.—The Chairman initiated a discussion on this subject. His experience was that if he took wheat to the miller he bought always on a standard of 60 lb. per bushel, but if any part was inferior in quality the buyer naturally reduced the price. The f.a.q. standard appeared to him to be mainly a merchant's question, but he would rather see a fixed standard than the alteration each year. Mr. Schinckel favoured two standards if it was practicable. Mr. Low pointed out that the proposal to fix the standard at 60 lb. offered no encouragement to any one to clean his wheat properly.

WHEAT PEST.—Mr. Schinckel tabled specimen of beetles which were in large numbers in one crop in the district, and were doing much harm to the wheat. Stock Inspector Williams said he had often seen them at Mount Gambier, living on different kinds of vegetation.

MANURES FOR POTATOES.—In reply to question, the Chairman stated that he had tried applying commercial fertilisers before planting and in the trench with the setts, and found the latter the better practice. [Some of our potato growers make it a practice to apply the manure above the setts, either soon after planting or just as the potatoes come through the ground.—Ed.]

DAIRYING AND TUBERCULOSIS.—Dr. McMillan read a paper on this subject. The question of the compulsory examination of stock, particularly cows used for dairy purposes, was of the utmost importance in dealing with the question of the spread of tuberculosis. Tuberculosis was the greatest scourge of the human race, and, while it was not possible to say what proportion of infection was due to direct contagion from cattle, it behoved them to do all in their power to prevent or lessen this infection. It had been proved that the disease in the human being was caused by the same bacillus as in the cow, and that it can be directly communicated from the latter to the former is now admitted. The organism grows within certain narrow ranges of temperature, and cannot develop in the milk after it is drawn from the cow. The introduction of the tuberculin test had proved the disease to be far more prevalent amongst cows than was formerly supposed. The more stock are confined in small areas the more prevalent the disease. The more fresh air and natural conditions the less infectious. While tuberculosis was widely spread amongst cattle, it did not by any means follow that the milk from all these cows contained the germs of the disease, though when the udder was affected the milk was generally affected also. In the early stages of the disease the milk is usually normal, but as it progresses the milk becomes thin and watery. With tuberculosis of the udder there was usually a hard but painless swelling, confined to one quarter. Other kinds of inflammation of the udder were generally accompanied by pain. Milk from cows suffering from diseased udders should on no account be used. When the disease is located in the lungs or other organs of the body the danger of infection was only slight, but the difficulty was that they could not know what day the danger would become acute. In healthy adults the danger of infection was small, but with weakly people and infants it was very different. It was exceedingly difficult at any time to prove direct infection from the cow, but the presence of the disease in the digestive organs cannot be explained by infection from air laden with the bacillus. While it was impossible, therefore, to say to what extent tuberculosis was conveyed from beast to man, it was incumbent upon them to restrict in every possible way this source of infection. The bacillus of tuberculosis had been found in milk and cheese, but, as these products were only consumed in small quantities at one time, he thought the danger of infection very slight. The danger was reduced by heating the milk. If kept at a temperature of 155 deg. Fahr. to 160 deg. Fahr. for 15 to 20 minutes, all germs would be destroyed. Danger of infection was also lessened by dilution of the milk. There was less risk with mixed milk from a herd than from the milk of one cow, unless that cow was known to be free from disease. As there was no positive means other than the tuberculin test of determining in the early stages of the disease whether an animal was affected or not, he would advocate making the test compulsory for all cows. Mr. Williams said the difficulty of detecting the early signs of the disease by outward appearance was recognised by all scientists as a source of danger. Any outward symptoms that showed later could not be mistaken for fever by

any one knowing much about the disease. They might have inflammation of the udder not due to tuberculosis, but when they found any cold, lumpy swellings they should have the beast examined. He considered the tuberculin test very satisfactory. It was simple, and not costly, and there was no reason for the prejudice which had been fostered in some quarters against it. As soon as owners noticed any suspicious appearance about their stock they should report the case to the Stock Inspector, who would be only too glad to examine the animals and advise as to treatment. In reply to question, Mr. Williams stated that under the Health Act any herd could be tested with tuberculin under the orders of the Local Board of Health. Dr. McMillan doubted whether the power to test cows applied to other than those suspected of being diseased. A vote of thanks was accorded to Dr. McMillan and also to Stock Inspector Williams for their attendance.

Forest Range, August 25.

PRESENT—Messrs. Monks (chair), J. H. and A. Green, Rowley, Trevenan, Vickers, Collins, Hackett, Waters, and one visitor.

BORDEAUX MIXTURE.—Mr. J. Vickers read a paper on this subject. The right time to spray with Bordeaux mixture is just before the flowers open; in fact, it was better to have a few flowers right out than to spray too early, as until the buds have started to expand, the mixture cannot reach the spores of the disease. He thought the finer the spray and the quicker it was applied, provided that it was done thoroughly, the better the results. The trees do not require washing, but simply to be damped all over with the spray. Too much spray rather causes the solution to run off, and is also wasteful. He strongly advised keeping the nozzles 3 ft. away from the part they wished to reach and to keep it moving steadily. It was a great saving of time and labour if the different varieties of trees were in blocks, as to get the best results each variety wants to be sprayed just at the right time. The general formula for Bordeaux mixture in South Australia was 4 lb. bluestone and 6 lb. lime to 40 gallons of water, while in Victoria the mixture was made of 6 lb. bluestone and 4 lb. lime and 40 gallons of water. As far as he could learn, the two mixtures were equally effective. Some of their orchardists add sugar or treacle, and in Victoria salt, to make the mixture adhere better, but his experience was that if they had one or two dry days following the application of the ordinary mixture it took a lot of washing off, provided it had been properly prepared. Most of the success of the spray depended upon the way it was prepared. In a fair-sized orchard it was a good plan to use two 50-gallon casks and two of 25 gallons capacity. Weigh out the quantity of bluestone estimated to be required for one day's spraying. Suspend this in a piece of branbag overnight in one of the large casks, putting in one gallon of water to each pound of bluestone. A kerosine tin full of this stock solution will, with the lime water, make 40 gallons of spray. Put 4 gallons of this stock solution into one of the smaller casks, and add sufficient water to make up to 20 gallons. Take 6 lb. of good fresh lime, slake it slowly with water, and strain it through a branbag into the other small cask, and add water to make 20 gallons. Now pour the two solutions steadily and at the same rate into the other large cask, keeping both agitated all the time; allow it to stand for a short period and stir again, when the mixture will be ready for use. In using the lime they must never forget that it must be fresh, and that some of it will fail to pass through the strainer. Allowance must be made for this when weighing it out. If he were asked if Bordeaux mixture was a cure for fusieladium he would say "Yes," in spite of the fact that he knew of careful, painstaking gardeners who year after year used it with little benefit. He was, however, quite prepared to qualify this "Yes," because he knew that the man in a rich, shady gully was in a very different position to the man on a bright hillside, where the trees dry in a short time after rain ceases. In the gully, however, it often remained damp and steamy for days at a time, the trees were dense, and the situation shady. Under these conditions, and with varieties susceptible to the disease, given fairly damp, misty weather in October and November, the grower might spray almost every day and still suffer from the disease, whereas another orchard, on high ground, with open, spur-pruned trees, would be very largely benefited by only one spraying.

Virginia, August 22.

PRESENT—Messrs. Hatcher (chair), J. and S. Taylor, Baker, Huxtable, Nash, Sheedy, Odgers, Thompson, and Ryan (Hon. Sec.), and six visitors.

FODDER CROPS.—Mr. S. J. Taylor read a paper on this subject. He believed in the near future they would pay far more attention to green fodder crops than they were now doing. A supply of green feed in late autumn and early winter was of great value, especially to the dairyman, who is thus enabled to produce more butter when prices are relatively high. Besides this, stock that get a supply of green succulent feed in the summer and autumn keep in better health than those on dry feed alone. On most farms they could easily set apart a small paddock, convenient to the homestead, on which to grow fodder. For horses he would sow barley with the first rains. Usually this would be fit to cut early in July. For sheep and cattle, rape sown early will give good returns. Rape will thrive on most soils, is cheap, and a splendid milk-producing fodder. It will do best on fallow land, but in any case the soil should be worked to a fine tilth. Many object that rape taints the milk, but with proper management this can be overcome. Sowing oats or barley with the rape would lessen the difficulty, while if the cows were only allowed in the paddock for a short time, and removed at least two hours before milking there would be little or no taint. Stock must not be turned on to rape when it was wet, or losses from bloat or hoven may result. Rape grows quickly again after the stock have been removed. All the stable manure available should be applied to the land to be sown for green fodder. Those who have a supply of water cannot do better than grow lucerne for summer fodder, as they had nothing to equal it for quality or yield where they could irrigate it. Even without irrigation it would pay when they had a moist summer. Maize and sorghum may be grown with a fair amount of success. The former, though not so hardy, was more succulent and nutritious than sorghum. Mangolds and pie melons can usually be grown successfully, and will be found very useful.

MANURE FOR SANDY LAND.—Members were unanimous that farmyard manure was the best for sandy land. When this was not available one member recommended bone super, and another, after numerous tests, found that a manure with a fair amount of nitrogen in it was most satisfactory.

Petina, August 25.

PRESENT—Messrs. W. Penna (chair), Starkie, Thompson, Norton, M. R. Penna, and Fiddaman (Hon. Sec.), and two visitors.

PLOUGHING.—Mr. L. Starkie read a paper on this subject. In the first ploughing of scrub land he thought it well to break up the soil to a depth of about five inches, as, while the crop would probably be no better than if ploughed shallower, the land will be all the better afterwards for the deeper working. Future ploughing should be about three inches deep. A nine-inch furrow was quite enough, as if made wider all the land is not moved. He would leave the soil as open as possible, so that the weather may exercise its full powers on it. In this locality, where the soil was generally loose, he thought that the sooner the plough is put into the land after harvest the better. On the plain land in the district, four inches was deep enough to plough.

Orroroo, August 26.

PRESENT—Messrs. Moody (chair), Lillecrapp, Matthews, Opperman, Copley, Harding, Robertson, Dunn, and Tapscott (Hon. Sec.), and visitors.

DAIRYING.—Mr. P. H. Suter, Dairy Instructor, attended by invitation, and a short talk on dairy matters took place. A visit of inspection was paid to the Hon. Secretary's homestead, and the dairy herd and garden examined. Several other farms were visited, and in the evening Mr. Suter gave an address at a public meeting on dairying.

Dowlingville, August 25.

PRESENT—Messrs. Mason (chair), Montgomery, Crowell, Watkins, and Lock (Hon. Sec.).

FALLOWING.—Discussion on fallowing and the best methods of keeping the fallows clean took place, but no definite conclusions were arrived at. [On a subject of this character there should have been some points of a practical nature to report. Members should always bear in mind that the main purpose of publishing reports of meetings is to convey to the readers of *The Journal* the views of members of the Branches on the various subjects discussed. Nothing is gained by publishing the mere statement that a meeting was held on such and such date and certain members were present.—Ed.]

Dawson, August 20.

PRESENT—Messrs. Renton (chair), Schebella, Sampson, Collins, Muller, Kelly, and Nottle (Hon. Sec.), and one visitor.

SIZE OF WHEATSACKS.—Discussion on this subject took place. Members were of opinion that a three-bushel sack would necessarily be shorter and less convenient to handle. Besides, being lighter, boys would be expected to handle them. Members were opposed to the proposal to reduce the size of the sack, as, without being of any real benefit, the change would only entail extra expense on the farmers. Members strongly object to the present system of selling wheat, bags in.

Nantawarra, August 31.

PRESENT—Messrs. R. Nicholls (chair), E. J. Herbert, Rattew, Pridham, Dixon, Dall, Greenshields, and J. Nicholls (Hon. Sec.), and one visitor.

PAPER.—At previous meeting Mr. E. J. Pridham read a lengthy paper on "The World's Financial Difficulty." This paper was discussed by members, but there is nothing in the report to show whether they were satisfied with Mr. Pridham's solution of the question.

Mount Bryan East, August 28.

PRESENT—Messrs. Dunstan (chair), Honan, Pohlner, T. and J. Wilks, Bryce, and E. Wilks (Hon. Sec.), and a number of visitors.

VISIT TO HAWKESBURY COLLEGE.—Mr. R. W. Dunstan reported at length on recent visit to Hawkesbury Agricultural College.

MILK-TESTING.—Mr. Teddy reported purchase of a Babcock tester on behalf of this Branch. It was decided that the tester be available for use by members in testing their cows.

Hartley, August 26.

PRESENT—Messrs. Wundersitz (chair), W. and C. Brook, Kutzer, Jaensch, Reimers, and Fry (Hon. Sec.).

HORSE-BREEDING.—The Chairman read a clipping containing report of a lecture on this subject, and considerable discussion followed. Some of the members stated that they had noticed horses which were losing the hair in patches on various parts of the body, leaving the skin rough and scabby. They wished to know cause and treatment to follow. [Probably some animal parasite. The Chief Inspector of Stock advises to wash parts with warm water, then apply a good lather with carbolic soap, which should be allowed to remain until next day, when it should be washed off.—Ed.]

Wepowie, August 23.

PRESENT—Messrs. Gray (chair), MacNamara, Fisher, T. and J. Orrock, Bishop, Crocker, Helir, and Halliday (Hon. Sec.), and two visitors.

FARMING.—Mr. J. Fisher read a paper on this subject. In this district about half the area of the holding was cropped each year; but, in his opinion, this was a mistake. It was, however, mainly due to the holdings being too small. To make a comfortable living in this district at least 1,000 acres were required. To make the best of the farm, it should be divided into 100-acre paddocks and sheep-proofed. Not more than 300 acres should be cropped each year, and all should be on fallow land. This would give a fair return in ordinary seasons, and would allow the land to be cropped every third year. Seeding should be commenced about the beginning of April and finished by the middle of May. He would sow 50 lb. of wheat and 56 lb. super per acre. Fallowing should be started directly after seeding, as in most years they got best returns from early fallow. A team of eight horses with a four-furrowed plough should turn over 300 acres by the end of August. Plough about 4 in. to 5 in. deep. The spring and summer workings were important factors in the preparation of the land for seed. The first working should be finished before the ground gets too dry. Dry working should always be avoided, but the fallows must be kept clean. A few sheep should be kept, and on a farm of this character he considered they could safely average 100 sheep. These should be good young Merino ewes, which should be mated with Shropshire or Dorset Horn rams. With present prices for lambs, these 100 ewes should return about £40 per annum for lambs and £20 for wool. The best time to buy the ewes is off shears, as they can usually be obtained then cheaper than at any other time. A foal or two should be reared each season, care being taken to breed from good mares only, and to use a suitable stallion. For the working stock it will be necessary to cut about 40 acres for hay. The balance of 260 acres would be left for grain. The complete harvester was the cheapest machine to take off the crop.

Meadows, August 22.

PRESENT—Messrs. Pearson (chair), Ellis, Haines, Griggs, Catt, Brooks, W. J. and C. Stone (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the Chairman's residence, a profitable afternoon being spent in examining the orchard and farm. The clean and orderly appearance of the various outbuildings came in for special attention. All the cows on the place are housed at night in comfortable stalls. A large dam, measuring $4\frac{1}{2}$ chains each way, supplies water for the garden, etc., during the summer. Portion of this farm was badly overrun with blackberries, but by constant work they have been eradicated. Though the cost of the work has been heavy, land that was formerly valueless is now cultivated.

TESTING DAIRY COWS.—Mr. Pearson strongly recommended dairy farmers to test the yield of each cow and keep a record of same. He had found it paid him well to find out which of his cows had paid best, and which were unprofitable. As a result of his efforts to improve his herd, he stated that his cows now averaged 445 gallons of milk per annum, and the quality up to 4 per cent. of butter fat. He asked the members to follow his example, and weigh two milkings from each cow every week, and test the percentage of fat occasionally. Some of the members agreed to do this and report results later on.

Longwood, August 27.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, T. G. and E. J. Oinn, Smith, Antuar, Russell, McGavisk, and Hughes (Hon. Sec.), and two visitors.

POTATOES.—Mr. T. G. Oinn read two papers from previous issues of *The Journal of Agriculture*, viz., one from issue of October, 1896, and one from September, 1896. Good discussion took place. Members generally preferred to plant shallow and earth up, than to sow deep and merely cultivate between the rows. The members regarded liberal manuring the chief factor in successful potato growing.

Gawler River, August 26

PRESENT—Messrs. A. M. Dawkins (chair), H. and F. Roediger, Winckel, Baldwin, Kreig, H. Dawkins, and Leak (Hon. Sec.).

NOXIOUS WEEDS.—Mr. Badman tabled specimen of ice-plant from the Northern districts, and described to members the way in which it took possession of the land. He stated that the plant he showed them had been hanging up by its roots for over five weeks, but had not lost all its vitality.

LINSEED FOR HORSES.—One member asked for information concerning the feeding of linseed to horses. Members differed in their opinions, some favouring its being crushed; others would boil it. When used with oats, several members advocated using whole linseed, as oats when crushed and kept for a few days appeared to lose some of their strength.

OATS FOR HORSEFEED.—Members spoke favourably of Champion oats for feeding purposes.

Mundoora, August 26.

PRESENT—Messrs. Harris (chair), Haines, Dick, Mitchell, Stringer, Aitchison, Loveridge, Shearer, Button, and Gardiner (Hon. Sec.).

STANDARD BUSHEL.—An animated discussion on this subject took place. The Hon. Secretary read several papers from *The Journal of Agriculture* dealing with the question, but he feared some of the writers were wheatbuyers or millers, who, no doubt, wanted a high standard. He could not see why they wanted a higher standard than 60 lb. Most of the members, however, opposed such a low standard, and a vote showed a large majority in favour of 62 lb. per bushel. A fixed standard was advocated by Mr. Shearer, and met with general approval.

DAIRYING.—Mr. Haines wished to know whether it was best to have their cows come in fresh every year and to keep them in milk as long as possible. He had a cow which had not been dry for over three years, and she was giving nearly as much milk as when she first came in. Several members thought that with cattle so profitable it was better to get a calf each year.

Woolundunga, August 13.

PRESENT—Messrs. Barrett (chair), Greig, Michael, Aldenhoven, Prosser, Smoker, Becker, Bentley, and Rogers (Hon. Sec.), and three visitors.

CULTIVATING TO PREVENT DRIFT.—Mr. J. H. Michael read a paper on this subject. He stated that twelve months previously he had dealt with this matter in a paper on "The Drought: Its Effects and Remedy," and had recommended breaking up the bare ground with a plough to stop the drift and cause vegetation to grow. In February, 1903, they ploughed up 30 acres of the hardest and most barren land they had on the farm. During the first week in March over 2 in. of rain fell, the result being a thick growth of spinach and saltbush, which had to be destroyed with the cultivator before the wheat could be sown. Owing to the dry weather in September the crop was badly blighted, and all they got off the paddock was about 10 tons of hay. After the hay was removed a thick growth of saltbush came up all over the land, and at present it was still covered with saltbush and spinach. Another 30 acres of loose, loamy soil, which in 1902 grew nothing, but started to drift badly, was sown in May, 1903, with wheat, the seed being scarified in. Owing to dryness only about half the seed germinated. After the hay crop was cut he got a good growth of saltbush and potato weed, especially the latter. They were so well satisfied with the result of their experiments that this year they had broken up and sown 700 acres of land which the previous season did not produce enough to keep five sheep alive. As they had only 2 in. of rain this year between February 15 and August 13 he did not expect to get any crop, but he was certain there was little danger of the land drifting. When they got a good fall of rain he fully expected to get saltbush, spinach, and other plants to grow sufficient, not only to prevent drift, but also to carry a moderate quantity of stock in good seasons. They still had about 500 acres of this barren land which they intended to treat in the same way next year.

Redhill, July 26.

PRESENT—Messrs. Stone (chair), Torr, Treloar, Nicholls, Ladyman, Wheaton, Wake, and Lithgow (Hon. Sec.).

LUCERNE.—Mr. E. L. Wake read a paper on lucerne-growing. He stated that, given a favourable germination on suitable soil, which had been properly prepared, lucerne would return a profit on the outlay the first year. The land should be ploughed 5 in. or 6 in. deep, though on loose soil it was not necessary to go so deep. It will thrive almost anywhere on the Broughton Flats, if properly treated. After ploughing, harrow the land two or three times; then roll with heavy roller. If the land is inclined to be rough, roll first and harrow well afterwards. What is required is to get the land solid, but fine on the surface. Broadcast the seed after a light harrowing, and then roll. About 9 lb. of seed per acre will be required; if drilled 7 lb. will suffice. Fifty-six pounds per acre of super will be found beneficial if the land has been previously cropped with wheat. Care must be taken not to sow when the land is wet and sodden. There was always more even germination if the ground contained sufficient moisture to cause the seed to germinate without any rain falling. Once well started it was surprising how lucerne will resist drought. In this district he advised sowing seed in about the middle of April or early in August. He had not found it profitable to sow the seed with wheat, as it makes too fine and spindly a plant. He always put in wheat on the lucerne paddock the second year, getting a mixed cut of wheat and lucerne for hay, and a good growth of lucerne in the summer. This practice could be continued year after year if desired. In grazing lucerne, stock should not be turned on until it begins to come into flower. Where there was a large area, it paid to divide it into a number of small paddocks, so that the lucerne on each could be eaten off quickly and the stock removed to another paddock. It will be found beneficial to harrow the lucerne well during the winter, a more vigorous growth during the warm weather being the result.

Wilmington. August 24.

PRESENT—Messrs. Robertson (chair), Slee, Hannagan, McLeod, Broadbent, Shuppan, Lauterbach, and Payne (Hon. Sec.).

STANDARD BUSHEL.—Mr. J. McLeod read a paper on this subject, describing first the way in which the f.a.q. standard for each season was fixed. He did not see how any fairer system could be adopted, and while he held that the Chamber of Commerce was the proper body to do this work, he was sure no objection would be raised to farmers being represented. No doubt there was more room for comment as to the time when the standard should be fixed, but the fact must not be lost sight of that the later districts must be represented in the sample. The date that would be just right for the North would be too early for the Lower North and South; and so a date suited to the South would be too late for the rest of the State. This necessitated fixing the standard at a date which meant that a portion of the Northern crop must always be disposed of under the previous year's standard. They heard a good bit about the farmers' losses owing to 62 lb. samples being docked prior to the standard being fixed last season, but they must not overlook the fact that owing to shortage from the previous year this early wheat fetched considerably better prices than wheat that was disposed of when the standard was fixed. They should also bear in mind that if next season's standard was, say, 62½ lb., or even higher, the first wheats would be sold under the 61½ lb. standard, and what would be docked later on would then take full market rates. One season with another, he could not see that any one lost or gained very much on this matter. There was considerable support given to the proposal for a fixed standard of 62 lb. per bushel, but he did not see how this was possible. They should have a standard as high as the season warrants, but not higher. While it would be a great mistake to fix it at 64 lb. if the season did not warrant it, it would be equally bad to fix it at 62½ lb. if they could supply 64 lb. wheat. There was no question whatever that with a high standard London buyers would pay more for our wheat, and consequently the local price would be better. Given that Parliament did fix the standard at 62 lb., two things might very likely happen. They might have a bad season, and although it had been published to the world that the standard was 62 lb., yet their merchants

would be compelled to say that they could not supply anything better than a 60 lb. sample. Or they might get next year a real good season, and be able to supply wheat going 63½ lb., yet their standard had been fixed at 62 lb. Victoria and New South Wales being equally favoured would have their official standard of, say, 63 lb., and they would get the preference in the London markets. To fix the standard as suggested would only hamper trade and cause loss to the farmers. In regard to docking for under standard wheat and not paying anything for wheat of the higher quality, this was undoubtedly a much vexed question. He did not see how the man buying for export could pay higher for wheat over standard for small quantities, but he believed it was always possible to get more than ordinary rates for such wheat from the millers, if quotations for special samples were asked for. Mr. McLeod gave an interesting illustration of the manner in which the weight of a sample of wheat was tested by the buying agents. After considerable discussion the majority present decided in favour of a fixed standard of 62 lb. per bushel.

"JOURNAL" COMMENTS.—In accordance with decision of previous meeting, Mr. Broadbent commented on some of the more interesting matters dealt with by the Branches and reported in August issue of *The Journal of Agriculture*. The members thought that the farmer at Yarcowie who stated that his fowls required very little feeding for three months out of the year must have referred to the period immediately following harvest, when they could gather a large amount of grain, etc., in the stubbles. Dealing with cases of mares slipping their foals on being worked after a spell, it was thought that the feeding had nothing to do with the trouble, but rather the fact that the mares had not been kept continuously in work. To give brood mares fitful work only was considered to be very dangerous. While members knew that selling cattle by live weight was practised in Scotland and elsewhere, they did not see how it would work under local conditions. Members would like Mr. Lutze, of Petina Branch, to furnish particulars re construction of concrete dams, to hold 17,000 gallons of water, at a cost of £9 12s. 6d.

IMPROVEMENT OF PASTURES.—The Chairman referred to paper on this subject, read at Strathalbyn Branch by Mr. J. Cheriton. While fully admitting the benefits that would accrue to pasture land from the application of fertilisers, he could not agree with Mr. Cheriton's statement that grazing deteriorated the pastures. A number of stations in the North, which he mentioned, were, prior to the advent of the rabbits, greatly improved by judicious stocking on the part of the managers. If Mr. Cheriton's contention was correct, it was only a matter of time for their pasture lands to become deserts. The real cause of the deterioration of the pastures was overstocking; the best grasses never being allowed to seed gradually died out, and their place was taken by inferior and weedy growths.

Port Lincoln, August 20.

PRESENT.—Messrs. Laidlaw (chair), Kinnmont, Shanahan, Bruce, Puckridge, Brown, Ridgway, and Sage (Hon. Sec.).

SUMMER FODDERS.—The Hon. Secretary initiated a discussion on this subject. He did not think that in this district bare fallowing would be profitable on much of the land, especially that of a light nature over a retentive clay. If this soil were broken up early in the season, the heavy winter rainfall, which passes through the light surface, would carry with it much of the soluble plant food. The surplus water drains away naturally along the clay and comes out lower down the slopes, so that there was great danger that the nitrogen would be leached out. He would prefer to sow peas on land fallowed in May or June, and either feed them off or plough them under later. Their heavy rainfall rendered it unnecessary to consider bare fallowing from the question of conservation of soil moisture. He believed that if they drilled in their fallow crops and manured and cultivated them the land would carry just as good a cereal crop as if treated as bare fallow. Phosphates were not so likely to be leached out; in fact, it was open to question whether in soil containing so much iron the water-soluble phosphates did not quickly change to iron phosphates. He thought they could grow millet, maize, sorghum, mangolds, tares, or lupins for summer feed in this district. Last season he grew maize, amber cane, and mangolds successfully on newly cleared

land. Mr. Puckridge stated that he had grown splendid crops of peas on what was termed heath land. He was satisfied that for sheep rape was about the best feed to grow. Mr. Shanahan had done well with golden tares and also with sorghum, but there was a lot of waste about the latter, stock failing to eat it up clean like they did maize. The labour connected with the growing of mangolds was too great for profit. For an acre or two for grazing for a cow he thought Italian rye grass the most profitable. He had sown about 3 lb. of lucerne seed per acre with the wheat, and the plant was coming along well. Rape and kale also did very well, but he believed that if a man fallowed 300 acres for wheat and kept a flock of Merino sheep carrying good fleeces he would be better off than if he tried to grow a variety of crops. He found that in this district it did not pay to work the fallow too much. Most of the members agreed with Mr. Shanahan. The Hon. Secretary tabled mangold weighing 22 lb. which was grown on land that twelve months ago was not even cleared.

Scales Bay, August 13.

PRESENT—Messrs. J. J. Roberts (chair), Crowder, Newbold; W. J. Roberts, and five visitors.

CHANGE OF NAME.—Considerable discussion on the future working of the Branch took place. It was decided to meet at Calca in future, and to change the name of the Branch to Calca. Additional gentlemen were nominated as members, and the Chairman made a strong appeal to those present to endeavour to interest others in the work of the Bureau.

Port Pirie, August 20.

PRESENT—Messrs. Wright (chair), Humphries, Teague, Jose, Lawrie, Hector, Johns, and Wilson (Hon. Sec.).

BRANCH LIBRARY.—Discussion on the question of forming a library of agricultural literature in connection with the Branch took place, but the majority present opposed the proposal on account of the lack of interest shown in the Branch by the members.

ICE PLANT.—Mr. Crispin reported adversely to proposal to carry out experiments this year, with a view to destroying the ice plant.

PROGRESS IN AGRICULTURE.—Mr. R. F. Humphries read a paper on this subject, tracing the progress in farming operations in South Australia from the early days onwards. The improvements in the various cultivating and harvesting implements had undoubtedly greatly lessened the manual labour attached to farming. The use of phosphates had been one of the greatest strides they had made in their work, and it seemed strange to them now that they did not resort earlier to the use of manures, as every reasoning man knows that he cannot continue to remove plant food from the land without exhausting it. Many districts which formerly produced but inferior crops were now flourishing, but what was greatly lacking in other districts was sufficiency of rain to make it pay to use manure. There was no doubt that it would pay even with rich land to keep it up to a high standard by good tilling and manuring, rather than to continue to grow crops without attempting to replace the constituents removed by the plants. Farmyard manure could be made better use of than was generally the case. Its bulk of straw restored organic matter to the soil, and would prove of great value. The practice of fallowing, which had become so general, was an important factor in obtaining good crops. It allows free access to the soil of the various gases contained in the air. These act upon the constituents of the soil in such a way as to render fit for the use of the plants certain constituents that were what might be called dormant. Fallowing also assisted to conserve moisture, and was necessary in cleaning the land of weeds. He considered that agricultural colleges, worked on a good system, would be of great benefit to the community, as their progress would be more marked if their farmers were well up in the principles of agriculture. A great mistake was often made in supposing that the actual work on the farm was so simple that there was really nothing much for any one to learn. A knowledge of the principles of agri-

culture, when associated with good practical knowledge of the business of farming, would go a long way to successful operations.

STRIPPERS CRACKING THE GRAIN.—In reply to question how to prevent strippers from cracking the wheat, Mr. Johns advised that the bars of the beaters should not run too close to the concave; there should be space enough to get the thumb between them. The beaters should run as close to the comb as possible and not run at too great speed. The Chairman thought a great deal depended upon the set of the concave; if set forward the grain was likely to be cracked.

Rhine Villa, August 26.

PRESENT—Messrs. Payne (chair), Start, Mickan, Schick, and Vigar (Hon. Sec.).

ANNUAL REPORT.—The Chairman gave a short *résumé* of the work done during the year. Twelve meetings had been held, with an average attendance of eight members. On the whole, the meetings had been fairly satisfactory, but he hoped they would do better work in the future. Owing to the scattered population and also to the limitation of their operations on account of the dry district, their work as a Branch was considerably hampered.

Wilson, August 27.

PRESENT—Messrs. Gill (chair), Logan, Harrison, Meyer, Coombe, Ward, Nelson, Sexton, and Neal (Hon. Sec.), and four visitors.

FALLOWING.—Discussion on this subject took place. Members generally considered that early fallowing gave the best returns. Some preferred to leave the land rough for a time, while others preferred to harrow as soon as possible after ploughing. It was agreed that the red land and the white land in the district required to be treated differently. Three to four inches was considered deep enough to plough here, and as much after-working as possible should be given. Where a set plough could be used it was preferable to the stumpjump plough.

Carrieton, August 29.

PRESENT—Messrs. Gleeson (chair), Martin, Manning, Kaerger, Hupatz, Cogan, O'Halloran, Steinke, Vater, Ormiston, Davies, and Bock (Hon. Sec.).

HORSE-BREEDING.—Mr. Kaerger read a short paper on this subject. Breeding draught horses outside Goyder's line of rainfall was a very risky undertaking, as the seasons were too uncertain. In bad years the purebred draught horses were the first to fall away. He found the cross of draught horse with blood mare, or *vice versa*, produced a horse more suitable than the pure draught to their conditions. They were hardier, more active, and quite as useful as the draught. It was a mistake to think any mare suitable for breeding, as not one out of ten could be relied upon to rear a foal each year. A mistake was often made in the treatment of the "in foal" mare. Because she is to be spelled shortly she does not receive as much food and attention as the other horses. This results in the mares slipping the foals or bearing weakly progeny. Then, many farmers put the old mares to the stallion, and these were often in poor condition, and naturally the result is not satisfactory. If younger mares were used, and these were properly treated, there would be fewer failures in breeding, and the owners of stallions would not so often be blamed for what is no fault of their horses. He believed that in the North it would pay a man with five or six mares to keep a stallion, and to rear several foals every year. The stallion could be used during the greater part of the year for ordinary work, and the little extra cost of his keep would be repaid many times. He found that, taken all round, the progeny of blood and draught crosses were good workers, and useful animals for most farm purposes. If any proved too spirited and fast for the farm, they would sell readily at a price that would leave the breeder a fair profit. A long discussion took place, members generally agreeing that the cross suggested was a good one for this district.

Quorn, August 27

PRESENT—Messrs. Thompson (chair), Cook, McColl, Rowe, Noll, Herde, Finlay, Smith, Brewster, and Walker (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members generally opposed the Kapunda proposal for a standard of 60 lb. per bushel, but favoured the Crystal Brook suggestion for a fixed standard of 62 lb. It was agreed that a 60-lb. sample would be decidedly inferior, and would result in lower prices being realised in London for South Australian wheat. Members also thought that in respect to wheat under the f.a.q. standard, instead of the present system of docking 1d. per bushel for each pound under weight, the weight paid for should be reduced 1 lb. per bushel. This would make the proportion of reduction in price vary with the price of f.a.q. wheat. Several members claimed that, as buyers paid less for under-standard wheat, it was only fair that the farmers should get something above market price for over-standard samples.

SORE SHOULDERS IN HORSES.—Mr. J. Smith read a paper on "Why Horses Have Sore Shoulders." This trouble was often due to neglect to attend to the lining of the collar. The collar should fit the horse's shoulders, and the hames fit the collar. The collar should be kept well stuffed, smooth, and oval in shape. It must not be allowed to get flat on the inside. Flat collars are frequently the cause of sore shoulders. It was very little trouble to run the hand down the horse's shoulders each morning to find out if anything was wrong before putting the collar on. If any lump or sore is felt, the horse should not be harnessed up, but the cause of the trouble should be sought. It may be that there is too much stuffing in the collar, causing it to bear too much on one place; it may be due to a burr or some foreign matter in the stuffing. The lining should be undone and the trouble removed. As a rule, ten minutes or so will rectify matters. In reply to a question as to cure for sore shoulders, Mr. Smith stated that nearly all farmers with horses suffering from sore shoulders had some cure or other; but the fact that their horses still suffered from sores did not speak very highly of the so-called cure. The farmers' best plan was to attend to the collars and to the horses' shoulders and prevent sores.

Hawker, August 24.

PRESENT—Messrs. Borgas (chair), A. and F. Hirsch, Wardle, Schuppan, Cannell, Pampa, Iredell, and Smith (Hon. Sec.).

STANDARD BUSHEL.—Members favoured the adoption of a fixed standard of 60 lb. per bushel.

TREE-PLANTING.—Mr. A. C. Hirsch advised ploughing the land twelve months prior to planting. Other members agreed that if this were done the trees were more likely to grow than if the soil was broken up just before the trees were planted. Mr. Cannell advised members to raise trees from seeds, as the locally grown plants would be acclimatised, and be more likely to succeed than any that were brought from a different district. Mr. F. C. Hirsch stated that he had good results from trees of his own rearing. Mr. A. C. Hirsch tabled portion of a root of pepper tree measuring nearly 4 in. in diameter, which he cut from a root near the surface, and 24 ft. from the tree. He had an underground tank 18 yards from the tree, which was planted on the opposite side of the house. The roots had travelled beneath the house, raising the floor in places, and had found the tank. His experience should warn others against planting these trees near to a house or tank.

Crystal Brook, August 20.

PRESENT—Messrs. Hamlyn (chair), Hutchison, Venning, R. and P. Pavy, Weston, Townsend, Davidson, and Symons (Hon. Sec.).

STANDARD BUSHEL.—The Hon. Secretary read letters from a number of Branches approving of the proposal for a fixed standard of 62 lb. per bushel.

CLOSER SETTLEMENT.—Mr. B. Weston read a paper on closer settlement, dealing with the utilisation of the land purchased by the Government for subdivision, and on the relative amount of taxation paid by the man who used his land for wheat, as compared with the man who keeps only sheep.

Onetree Hill, August 28.

PRESENT—Messrs. J. Bowman (chair), F. and G. Bowman, Blackham, Ifould, Thomas, and Clucas (Hon. Sec.), and three visitors.

EGG-LAYING COMPETITION.—The educational value of these competitions was discussed. It was agreed that the results indicated that it was possible for careful poultry-keepers to evolve a good laying strain out of most breeds. The fact that the Silver Wyandottes figured at both ends of several of the laying competitions was an indication of the importance of strain in egg-laying.

STRAINING WIRE-NETTING.—By invitation, Mr. R. C. Taylor submitted models of appliances for putting up and straining wire-netting and for un-rolling fencing wire. Members were very much pleased with the models, and thought that Mr. Taylor's invention would save labour, and at the same time avoid sagging or warping of the wire. A hearty vote of thanks was accorded to Mr. Taylor, who stated that any farmer could make these appliances at little cost and labour.

Boothby, August 9.

PRESENT—Messrs. Whyte (chair), Way, Foulds, Gillings, Chaplin, Henderson, and Turnbull (Hon. Sec.), and five visitors.

OATS.—Members were unanimous that it was profitable to grow oats on every farm, not so much for sale as on account of their great value as horse-feed. Some of the members objected to the feeding of oats, as they would dirty the land, particularly when used in the field for the midday meal. Mr. Whyte pointed out that there was nothing serious in this objection, as by crushing the oats their germinating power would be destroyed and their value for feeding improved.

Utera Plains, August 20.

PRESENT—Messrs. R. Deer (chair), Venning, H. and R. West, J. Deer, jun., Hale, Guider, Harnhardt, Jacobs, Barrett, Abrook, A. R. S. and A. R. Ramsey (Hon. Sec.), and twelve members of Elbow Hill Branch.

HOMESTEAD MEETING.—Members of the two Branches met at Mr. A. R. Ramsey's residence and during the afternoon inspected the buildings, etc., and also indulged in cricket and other sports, a very enjoyable afternoon being spent.

DAIRYING V. SHEEP-FARMING.—Mr. A. Venning read a paper on this subject, in which he contended that under local conditions sheep would pay the farmer better than cows. He considered that 10 cows would cost quite as much as 100 sheep to keep, while altogether he thought the labour taken the year through would about balance.

ICE PLANT.—Discussion on this subject took place. In reply to question as to whether stock would eat the plant, members generally thought that sheep and cattle would eat it rather than starve.

Redhill, August 23.

PRESENT—Messrs. Stone (chair), Kelly, Robertson, Wheaton, D. and J. N. Lithgow (Hon. Sec.).

ANNUAL REPORT.—Seven meetings held; average attendance, eight members; six papers read and discussed. At previous annual meeting a programme for the year was drawn up, and this plan has proved a success, the meetings being generally interesting. Messrs. F. H. Torr, H. E. Kelly, and J. N. Lithgow were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

CONGRESS.—Members are in favour of Congress meetings being commenced on the Tuesday morning of Show week, in order to avoid clashing with other meetings later on in the week which farmers desire to attend.

Hahndorf, August 27.

PRESENT—Messrs. Spoehr (chair), Gallasch, Bom, Jaensch, Sonnemann, and Schubert (Hon. Sec.).

CATTLE COMPLAINT.—Mr. C. Jaensch initiated a discussion on this subject, dealing principally with dry bible. He thought this trouble was mainly due to cattle being kept too long on hard dry feed, the functions of the "bible" become weakened, the fibrous matter accumulates and becomes hard, causing inflammation, which probably spreads to the surrounding tissues, and sometimes pulmonary troubles follow. Mr. Jaensch spoke highly of Stockholm tar rubbed on the nose of the affected beast. Mr. Spoehr stated that when he suspected a cow to be affected by dry bible he gave her a drench consisting of 8 oz. Epsom salts, half a pint of linseed oil, and 1 oz. saltpetre, which he found very effective. Two doses were usually given. Mr. Sonnemann reported having noticed worms in the excreta of one of his cows. The worms were about 4 in. long, and similar in appearance to the worms found in horses. He gave $\frac{1}{2}$ oz. sulphate of iron in half a pint of water, with good effect. Mr. Jaensch stated that he had never found these worms in cattle killed by himself.

APPLES.—Mr. Gallasch reported on results of summer pruning of his apple trees, being thoroughly satisfied with the results. He also referred to the question of site and drainage as affecting the quality of the fruit. Apples grown on rising, well-drained soil were much superior to those grown in low, wet situations.

Ardrossan, August 24.

PRESENT—Messrs. Dinham (chair), Cane, Barton, Wilson, R. Dinham, Morgan, Henderson, Cornish, and Opie (Hon. Sec.).

WORK OF BRANCH.—Discussion took place on the best way to revive the interest in the work of the Branch. It was decided that a programme for the year be drawn up at once, and that each member be held strictly to his appointment. Every fourth meeting will be made a special public meeting, at which a *résumé* of the work at the three previous meetings will be presented for discussion.

STANDARD BUSHEL.—Mr. Cane initiated a discussion on this subject. He objected to the proposal for legislative interference, and maintained that they should on no account have a lower standard than 62 lb. It was resolved that the standard should be fixed as high as possible, to maintain the reputation of the State, and that extra should be paid for over-standard wheat; also that some better and more reliable method of ascertaining the weight of the sample should be adopted by buyers.

Lyndoch, August 25.

PRESENT—Messrs. Kennedy (chair), Ross, A. and H. Springbett, Warren, Woolcock, Zimmermann, Schenke, Burge, Mitchell, and E. Springbett (Hon. Sec.).

STORING LEMONS.—At previous meeting, Mr. Woolcock tabled sample of lemons picked in November, 1903, and stored in dry sand. The fruit was in perfect condition.

PUREBRED POULTRY.—Paper read by Mr. Kluge at previous meeting was discussed. Three of the members endorsed the writer's contentions in favour of the purebred fowl, but Mr. Ross contended that for hardiness and laying qualities the ordinary barndoor fowl could not be beaten. Mr. Warren had reared purebred White Leghorns under exactly similar conditions to a sitting from ordinary farmers' fowls, and found the Leghorns the strongest and best.

BIRD PESTS.—Mr. H. Springbett read a paper on "The Destruction of Sparrows and Starlings." Grape-growers had found out to their cost the severe nature of the depredations of sparrows and starlings, and especially the latter. Many were making use of bird-scarers, but these simply frightened the birds from the garden of the man who had the means to erect a number to the garden of the poorer man, and did not in any way lessen the num-

bers of the birds. Some effective means of destroying them was needed. Many sparrows can be destroyed with poisoned wheat if used at the right time. In winter, when no grass seed was available, poisoned wheat was most effective. He found that by sprinkling a little of the grain along the ploughed land in the vineyard he destroyed a good many birds, but it was useless one man attempting this alone. Combined simultaneous action was essential if they were to do much good. He found poisoned wheat very expensive to purchase. He thought the starling would be more troublesome and harder to get rid of than even the sparrows, as they do not eat grain. [Some of the barley growers in the South hold a very different opinion.—Ed.] He thought poisoned fruit might prove effective. After the crop was gathered starlings may be seen in great numbers picking up the loose berries, and if some grapes could be poisoned and dropped about the vineyard, he believed a large number of birds would be destroyed. Dried currants soaked in a liquid poison would probably answer. Mr. P. Zimmermann also read a paper on this subject, in which he suggested the following scheme for dealing with the sparrow and starling pest. He would rate all property to the extent of, say, 10 per cent. on the ordinary district rate, to raise a fund to pay for the heads of the birds. He would fix the amount per head to be paid, and would make it optional for the ratepayer to pay his rate in cash, or by the equivalent in birds' heads. All property should be rated, as although all owners were not sufferers, they were, in a sense, breeders of these birds. Heads of birds only should be paid for, as to pay for eggs meant that sparrow farming would be practised. He thought they might leave the male birds alone, as an excess of males would tend to keep down the increase. He thought under some such scheme they could pay 1d. per head, and this would be sufficient inducement for boys and others to wage war on the birds. He hoped the word tax in this connection would not frighten them, as he was certain the losses now sustained were far greater than the amount that his proposal would involve.

BINDER RECORDS.—Mr. Warren called attention to a challenge to farmers by the D. M. Osborne Company to cut 45 acres of wheat in one day with one of their binders. A committee was appointed to arrange for a public test, if the firm in question would agree to the necessary arrangements.

Amyton, August 25.

PRESENT.—Messrs. Mills (chair), J. and T. Gum, Kelly, Wheadon, Hughes, Thomas, and W. Gum (Hon. Sec.), and nine visitors.

POULTRY FOR PROFIT.—Mr. S. Thomas read a paper on this subject. While a thorough knowledge of the business of poultry-keeping is essential to success, above even this is the necessity for keeping the proper class of fowls. He had kept various breeds for a number of years, including layers, general utility fowls, and table birds, but was now confining his attention to the laying breeds only. To obtain the maximum production at the minimum expense the hen should not exceed 4 lb. weight or be less than 3 lb. His experience was that, as a general rule, the smaller birds of any egg-laying breed were the most prolific. He preferred purebred fowls to any cross, but he would not use birds bred to the show standards, as laying qualities had generally been sacrificed for exhibition purposes. He considered the White Leghorns the hardest and most profitable layers; they were good foragers, and good winter layers. The Brown Leghorn was also a good winter layer. The cost of production of eggs under proper management should not exceed 2d. per dozen for eggs, when wheat was cheap, and 3½d. to 3½d. when wheat was 5s. 6d. to 6s. per bushel, and the average net profits from a large flock should reach 9s. 6d. to 10s. 6d. per hen per annum, with eggs at an average of 9d. to 10d. per dozen. He was afraid, however, that unless they could open up a profitable market in England for their eggs they would have to accept lower prices in future, as Western Australia was rapidly increasing her production, and they would lose that market. If a poultry-keeper fails, under present conditions, to net 10s. per hen per annum, it was evidence of want of knowledge of the business, or that he keeps an unsuitable class of fowl. [At this rate, poultry-keeping would be by far the easiest way of earning a living, as the labour of looking after, say, four hundred fowls would be nothing like as much as that attached to wheatgrowing on a scale that would net the farmer £200 clear each year. Taking Mr. Thomas's figures, we have

an average return of 9d. per dozen for eggs, which costs him 2d. per dozen for food, etc. At 7d. per dozen net profit it would require an average of over 200 eggs to clear 10s. per hen. Few would be bold enough to say that it was possible to raise a flock of 400 or more hens which would average 200 eggs per annum.—Ed.] As regards breeding, the common practice of introducing roosters of unknown lineage into the breeding pens in order to get new blood was very unwise, as the work of years might be destroyed in one season. To produce a flock of uniformly good birds, line breeding must be practised. In feeding, he would use little else than grain. Three times a week in the morning wheat meal might take the place of grain. Pollard is very poor food for eggs in proportion to its cost. Bran has a value on account of its action on the system, especially in the summer. For green feed he used salt-bush, native spinach, native geranium, thistles, and young charlock, cut and mixed with wheat meal and a little bran. If, however, the fowls could be induced to eat sufficient green feed without mixing it with meal and bran he would feed them almost exclusively on wheat, excepting a little bran occasionally in the hot weather. If bran is used in the summer in this way medicines should be unnecessary. Overcrowding must be avoided, and the birds kept under proper sanitary conditions. An interesting discussion followed, members generally agreeing that the White Leghorn was the most profitable for egg production. The Hon. Secretary, while agreeing that the smaller breeds were generally the best layers, thought it was a mistake to say that the smaller hens of any given breed were the best. This would mean that they would reject the best and strongest birds as unprofitable. His experience had convinced him that strain, more than breed, was to be studied in building up a profitable flock of fowls.

Kapunda, September 3.

PRESENT—Messrs. Shannon (chair), O'Sullivan, Harris, Teagle, Flavel, Weckert, Pascoe, Daly, Banyer, and Holthouse (Hon. Sec.), and visitors.

SELLING WHEAT BY AUCTION.—Mr. E. J. Whyborn gave an address on the subject of selling wheat by auction. He contended that by disposing of their wheat in that way farmers received the full value for over-standard samples. In Melbourne and Sydney the system had proved very successful. Millers and shippers paid more at these auction sales for prime samples of wheat than ordinary rates for f.a.q. wheat. Several members spoke in favour of the system which they thought could be as well applied to wheat as to wool and other produce.

OFFICERS.—This being the annual meeting, the Chairman requested that some other member should accept his position. Messrs. J. J. O'Sullivan, S. H. Harris, and H. A. Holthouse were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. The retiring officers and the representative of *The Kapunda Herald* were thanked for their services.

Watervale, August 22.

PRESENT—Messrs. Treloar (chair), Sobels, Williams, Scovell, and Castine (Hon. Sec.).

GRAZING ON SMALL HOLDINGS.—Mr. E. Treloar read a paper on this subject. Now the purchase and rental values of their land had increased so much it was necessary that they should study carefully how to put it to the very best use. He considered that grazing on a small scale would fit in well with their other operations. He was convinced that with continued good seasons the selling value of their lands would decline considerably, as they would have to accept lower prices for their produce. It was mainly the drought in the northern districts that had enhanced the value of land in the more certain areas; but, should good seasons occur in the former districts, they would find that, when comparing cost of production, they could not compete with these northern areas, especially in stock raising. There was no getting away from the fact that all their doings were largely governed by circumstances over which they had little control. At the same time, however, in a district like this, where, year in and year out, with an occasional

exception like the present season, which has been cold and late, they could calculate to a nicety what their land would carry, it was a serious mistake if any man has more stock than his land can properly sustain. To increase the carrying capacity of their land they must first divide it into smaller paddocks. Four to six paddocks of 50 acres each would be better than the same area in 100-acre paddocks. The extra fencing would cost a little, but the benefit derived from changing the stock from one paddock to another would more than pay for it. It would pay to heavily stock one of the paddocks occasionally and thoroughly clean up the feed, as the following growth would be much sweeter and better. Besides, to keep the rank growth fairly well eaten off will improve and strengthen it. One or two of the paddocks should always have some old grass left over to act as a protection to the new feed during the cold weather. If this were done, they would always have good grass to carry their stock through the pinch of winter. The paddocks with the best natural shelter should, if possible, be reserved for winter. If there is not sufficient shelter more should be provided by means of straw sheds or by planting small squares of quick-growing hedges in each paddock. Some summer green feed, such as lucerne or sorghum, should be provided. Where it can be grown successfully, lucerne is the best of all for summer. Where sorghum or similar crops are grown, it should be arranged to have a grass run in the same paddock, or near by, as when stock had eaten a sufficient amount of sorghum they would go on to the dry grass, which would counteract any tendency to scouring. Another necessary help to the well-doing of stock was an abundant supply of clean water. Stock should never be without water for any length of time, and, if possible, they should be able to get a drink when they wanted it. He noticed stock preferred well water to creek or dam, and did much better on it.

Whyte-Yarcowie, September 17.

PRESENT.—Messrs. Hack (chair), Dowd, Makin, Lock, G. and G. D. Mudge, Hunt, Kornetzsky, Hatherly, Mitchell, Francis, Pearce, Faulkner, Paul, Jenkins, and Boerke (Hon. Sec.).

CONGRESS.—Delegates to Congress reported on proceedings. They thought that with more firmness on the part of the Chairman the meetings would have been more profitable, as at times it was difficult to know what was before the meeting.

POULTRY.—Mr. J. Makin read a paper on this subject. He had attempted, with a fair amount of success, to raise good, all-round fowls, combining egg-laying with table qualities. This had been achieved by getting some first-class Buff Orpington roosters to cross with good layers of the ordinary hens on the farm. To get the best results, it was necessary to raise the chicks early, and he advised the use of an incubator. He would never buy a secondhand incubator, as it could not be relied upon. For ordinary purposes the capacity should be 40 eggs and upwards. It cost little more to run one of 100 eggs capacity than one of 25. The first hatch of the season gives some trouble, as the chicks have to be hand fed for a week or two, but later broods can be taught to eat by putting a few of the older ones amongst them. He found that with the early chicks most of this cross laid at four to four and a half months old, and all of them within five months. Attention and good feeding from the time the chicks were hatched was necessary. If the fowls have a good grass run, artificial aids, such as green cut bone, egg powders, etc., are not required. He would give them any scraps of meat, cooked rabbit, etc., available. With a good run they pick up all the grit they require. A great factor in winter eggs was warmth. He shut his fowls up at night during the winter. He had large netting coops, to hold about 40 fowls, inside the shed, and these were covered with bags, to keep the fowls warm. Every morning the coops are shifted, the ground swept clean, and lime or ashes sprinkled about to destroy vermin. A good run, clean, fresh water daily, and shade in the summer were necessary. If they wished to keep two breeds of fowls they could do so without yarding them by placing them in different paddocks, as the fowls have a strong sense of locality, and will not wander far. To make a profit out of fowls, a certain amount of trouble was necessary, but the better they were looked after the greater the profit. From

June 1 to August 31, from 40 hens and 67 pullets, he obtained 4,050 eggs, which, at market rates, were worth £16 7s. 8d. This amount would more than cover the cost for food for the whole year, not only of the fowls, but of a number of turkeys, geese, etc. The surplus cockerels, old hens, and bad layers were eaten on the farm, thus saving the butcher's bill. He thought it paid better to do this than send fowls to Adelaide, as with low prices and heavy costs the birds were worth more as meat than the net returns. His poultry yard cost him 1s. a day for food, which consisted of wheat, screenings, or barley, soaked occasionally by way of a change, kitchen scraps, etc., given twice a day. Recently he collected 91 eggs on one day. He thought pullets more profitable than hens for winter laying. He had recently obtained some Indian Runner ducks, which he thought superior to anything else for egg production. They were also very hardy, small eaters, and did not require housing.

SHEEP.—Mr. E. Jenkins read a paper on "Sheep on the Farm." On a farm of from 1,000 to 1,500 acres in this district about 200 sheep should be kept. He advised breeding lambs for the export trade, buying Merino ewes off shears. They should be six-tooth, and sound of mouth. These should be mated with Shropshire rams about the middle of November, and, under reasonable conditions, they could expect a drop of 95 per cent., which, by the end of September would give them quite 85 per cent. fit for sale, and weighing 35 lb. to 40 lb. each. Under present conditions these will average 10s. 6d. to 11s. each. The cull lambs, if kept until ten months old, will weigh about 50 lb., and will sell readily. The ewes should give a return of 5s. per annum for wool. At the end of the first year the farmer would practically have paid off the first cost of his sheep. The pure Merino lamb did not mature quick enough, nor was it large enough for export purposes. Breeding lambs paid better than fattening stores. The former business allowed the farmer to clear off a lot of his stock at good value before the dry weather sets in, and the ewes have more feed and a better chance to get into good condition for the next season. He would not mate maiden Merino ewes to Shropshire rams, as, owing to the size of the lamb, there would be considerable losses. Water must be provided in each paddock where it can be managed. It is a good practice to put a dam or well where it can be utilised for two or more paddocks. He did not think they could get such good or such quick returns from store wethers as from lambs, especially at present prices for wethers. Over-stocking must be avoided.

Cherry Gardens, September 23.

PRESENT.—Messrs. Partridge (chair), Jacobs, C. and J. Lewis, Burpee, Hicks, Potter, Stone, Metcalf, and Ricks (Hon. Sec.), and three visitors.

SEPARATOR V. FACTORY.—Mr. Potter called attention to error in report of August meeting. The result of the voting was that the motion advocating the support of the local butter factory by supplying it with milk or cream was lost.

FRUITGROWERS' ASSOCIATION.—Mr. Ricks referred to the aims and objects of the South Australian Fruitgrowers' Association, which he considered deserved the support of all growers. Members, while generally agreeing on the matter, considered that a mistake had been made in confining the membership of the Association to growers owning not less than two acres of orchard or vineyard.

Gladstone, September 3.

PRESENT.—Messrs. Goode (chair), Burton, Cook, Brayley, Inglis, Rundle, Greig, and Wornum (Hon. Sec.).

TESTING SAMPLES OF WHEAT.—Discussion on this subject took place, and delegates to Congress were instructed to move in respect to the method of testing the weight of samples, members being of opinion that a larger measure should be used and that a regular method of striking should be adopted by wheatbuyers.

Willunga, September 13.

PRESENT—Messrs. Binney (chair), Pengilly, Malpas, Valentine, Vaudrey, and Hughes (Hon. Sec.), and two visitors.

EXPERIMENTAL WORK.—This meeting was held at the residence of Mr. T. Pengilly, Aldinga, the special object of the visit being to inspect the experimental work being carried out by Mr. Pengilly, under the instructions of the Inspector of Fertilisers. A block of land of about 8 acres has been fenced off and set apart for experimental work. This year there are four plots, each of half an acre, sown to Gallant wheat. No. 1 has received 1 cwt. mineral super per acre; No. 2, 1 cwt. mineral super and 56 lb. sulphate of ammonia; No. 3, no manure; No. 4, 1 cwt. mineral super and 70 lb. nitrate of soda. Between each plot a drill width of field peas has been sown, and the whole block is surrounded by peas, which will be mowed and harvested to make roads around each plot for the binder when the cereal crop is cut. Surprise was expressed at the stoozing qualities of Gallant wheat, and, though too early to form any idea of the final results, there is no doubt that the manured plots will, with favourable weather, yield heavily. The field peas were also very promising. In a patch of lucerne sown last year Mr. Pengilly pointed out a strong-growing plant, similar in foliage, but coarser, than lucerne, and with long spray of white flowers. This was identified by the Inspector of Fertilisers as Bokahara clover (*Melilotus albus*), and was recommended for trial on some light, sandy ground, carrying but little feed. Mr. Summers explained briefly the objects of the experimental plots, which it was intended should be continued for five or six years. Members were afterwards entertained by Mr. Pengilly, who was thanked for his kindness.

SOURSOPS.—In reply to question as to getting rid of soursops on good soil, Mr. Summers suggested ploughing the weed under at once, working the land well, and sowing lucerne. He believed that once the lucerne got a hold it would beat the soursops. Mr. Valentine stated that he applied a fairly heavy dressing of salt to a small patch. This killed the weeds and, as far as he could see, had not injured the soil. After the salt had destroyed the soursops he ploughed the land quite six inches deep. Mr. Malpas mentioned that he had heard of a solution of arsenic being used with success for this purpose.

Mount Pleasant, September 9.

PRESENT—Messrs. Phillis (chair), Giles, Drogemuller, P. and J. Miller, Tabscott, Lyddon, Thomson, and Vigar (Hon. Sec.).

RUST-RESISTING WHEATS.—Members expressed their pleasure at the opportunity afforded of placing on record their appreciation of Mr. Marshall's services in the making of rust-resisting wheats.

WHEAT-GROWING IN THE HILLS.—Mr. Vigar read a short paper on this subject, and an interesting discussion ensued. The experience of members in respect to commercial fertilisers was that results varied very much in the different kinds of soils. Mr. Vigar got very poor results from super alone, but when mixed with bonedust results were satisfactory. Mr. P. Miller could see no difference between the results of the two manures. Mr. Giles had good results from super, but was now using nothing but material obtained from a deposit near the Murray. This contained a small amount of phosphate and a considerable quantity of lime. Mr. J. Miller stated that on land where super had been applied for seven successive years to cereal crops they could not now grow wheat. Members generally were of opinion that the reason fallowing was not successful in this district was that most of the land would not stand continual working.

Finniss, September 5.

PRESENT—Messrs. Collett (chair), Chibnall, and Henley (Hon. Sec.).

VISIT TO RENMARK.—The Hon. Secretary, who has recently returned from a visit to Renmark, gave an interesting account of the settlement, the methods of irrigation, and the results obtained.

Clarendon, September 13.

PRESENT—Messrs. Payne (chair), A. and A. A. Harper, J. and W. Spencer, Pelling, J. and P. Piggott, Morphet, and Wright (Hon. Sec.)

VISIT TO ROSEWORTHY.—The Chairman reported on visit to Roseworthy College, and thought it would repay any farmer or dairyman to pay a visit to the College Farm when he got the opportunity, as he would obtain a lot of information that would be of value to him.

Mallala, September 5.

PRESENT—Messrs. W. Temby (chair), Jenkins, Nevin, H. and A. Moody, S. Temby, East, Marshman, Wilson, McCabe, and Stephenson (Hon. Sec.), and six honorary members.

HON. SECRETARY.—Mr. Stephenson tendered his resignation as Hon. Secretary and member, as he was leaving the district, and was accorded a hearty vote of thanks for his services as Hon. Secretary since the inception of the Branch. Mr. T. Nevin was appointed Hon. Secretary.

VISIT TO VICTORIA AND NEW SOUTH WALES.—Mr. M. East gave an interesting account of a recent visit to the eastern States. His main object had been to enquire into methods of cultivation and the machinery used in the principal wheat-producing districts, and he came back satisfied that, as a whole, South Australian farmers were considerably more advanced in their work than their neighbours. Fertilisers were not used to such a great extent, and the cultivation in very many districts was very inferior. The system adopted by some of the large landowners of letting land for cropping at a rental of 10s. 6d. to 12s. 6d. per acre, or on the share system, was referred to, and was stated to have resulted in an improvement in the stock-carrying capacity of the land. The Victorian farmers estimate that there was sufficient hay in stacks in that State to provide for the normal requirements of two years, while in New South Wales supplies appeared to be ample. With the aid of a large map Mr. East showed the localities visited, and described the general characteristics of the respective districts.

Crystal Brook, September 17.

PRESENT—Messrs. Hamlyn (chair), Hutchison, R. and P. Pavy, Venning, Davidson, Solomon, Dabinett, and Symons (Hon. Sec.).

TESTIMONIAL TO MR. MARSHALL.—Members expressed pleasure at the opportunity afforded for recognising Mr. Marshall's services in respect to the introduction of rust-resisting wheats.

THE AGENT NUISANCE.—Mr. W. J. Venning read a paper on this subject. There was no disguising the fact that during late years, and this season especially, the farmers have been very much pestered by travellers representing various machinery firms. As no one could doubt that the farmers who used these machines had to pay the expenses of these agents, he strongly advised them to have nothing to do with them, but to purchase their requirements direct from the maker or importer. He could not see that there was any need for these agents, as the farmer knew what he wanted. As a matter of fact, the farmer was often persuaded against his better judgment to buy machines not really suited to his needs or required for his work. If they could transact their business direct and do away with the expense attached to travelling agents, he was quite certain they could buy the machinery at 10 per cent. to 15 per cent. less than now paid. The farmer should see the implements at work in the field, and judge for himself whether any particular make suited him better than another. If any neighbour bought a new machine, go and see it at work, as they were more likely to form a correct opinion of its capabilities from its actual work than from the glib-tongued agent. Then he thought that they should have sufficient patriotism to give the preference to local-made machinery if it was suitable to their requirements. They must not forget that the more men employed in manufacturing industries the greater the local demand for farm products.

Waikerie, September 17.

PRESENT—Messrs. Rowe (chair), Perry, Tuck, A. Lewis, sen. and jun., Jaeschke, Pickering, Jones, Blizard, Starr, Rogers, Wood, Barrows, and Green (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress, and the papers read were discussed. Mr. Cowan's paper on lucerne was favourably commented on. Regnet was expressed that no papers on fruit were read at Congress.

MARKETING FRUIT.—A discussion took place on the question of co-operating to put up dried fruits in uniform grades and under proper conditions. It was decided to convene a meeting of fruitgrowers to consider this matter.

Mount Remarkable, August 25.

PRESENT—Messrs. Casley (chair), Challenger, Foot, T. P. and G. P. Yates, McIntosh, Giles, Morrell, and O'Connell (Hon. Sec.).

CO-OPERATION IN THE PURCHASE OF MANURES.—The Chairman initiated a discussion on the question of members combining to purchase the manures they required in one line. Mr. Challenger thought the idea a very good one if those joining were able to put down the necessary money, which could be banked in the Savings Bank, but it was out of the question for any one to be responsible to the merchant for the joint order. It was agreed that a considerable saving could be effected in the price of manure in this way.

STEAM THRESHER.—The Chairman suggested that the farmers in the neighbourhood should combine to hire a steam thresher; but members considered the thresher a failure. They advised cutting a portion of the stubbles with the binder as soon as stripping was finished, to provide a supply of straw.

Koolunga, August 25.

PRESENT—Messrs. Butcher (chair), Button, Shipway, Sandow, Palmer, Fuller, Lawry, Cooper, Burgess, Buchanan, Butterfield, Jose, Perrin, and Noack (Hon. Sec.).

STANDARD BUSHEL.—Members differed in their opinions as to the wisdom of having such a low standard as 62 lb. per bushel, some maintaining that with a higher standard the farmers would benefit.

FALLOWING.—Mr. H. Butterfield read a paper on "Fallowing, and How to Treat It." The proper preparation of the fallow was one of the main factors in successful farming in the districts with light rainfall. He believed in early, but not dry, fallowing. The earlier the ploughing was started the better, provided the ground was moist and the land kept clean afterwards. On light, sandy soil he would plough deep, but on heavy, loose soil he would plough shallow. On the sandy land there was no trouble in getting a solid bottom again; but with loose, heavy soil, especially if the rainfall is light, there was considerable risk that they would not get it down solid enough. What they had to aim at was a solid seedbed, and a fine tilth on top. The plough cutting a narrow furrow was preferable to one cutting a wide furrow, as it did not leave such large clods. He did not think they could work the fallow too much, provided it was worked at the right time. In spring he would scarify or cultivate it lightly, but not when the ground is dry. Harrowing at any time, provided the land is mellow and moist, is beneficial. After harvest cultivate any hard patches, or, if possible, all the fallow, if not too dry. If rough or cloddy, roll, and follow with the harrows at once. Mr. Burgess found it beneficial to work the fallow in January and February. Mr. Butcher thought in some localities, on heavy land, deep ploughing was advisable, while shallow ploughing was necessary on the lighter soils. All members were agreed that the fallow should not be worked when dry.

Angaston, August 24.

PRESENT—Messrs. Rundle (chair), Player, Friend, Snell, Trimmer, Thorne, Smith, F. and A. Salter, and Sibley.

EXHIBIT—Mr. Trimmer tabled splendid sample of runner bean seed for distribution. This was raised from seed distributed by the Bureau several years ago, and had proved a very good variety. [Name, please.—Ed.]

BACON CURING.—Mr. James Rundle read a paper on this subject. Pigs for bacon should be fed on good sound food, with skim milk added, and topped up on crushed grain—peas, barley, or wheat—and killed at about 120 lb. Take the head off as soon as dressed, then cut the pig down on one side of backbone, thus leaving one side ready, with the exception of a little trimming, for the salt. Put other side on table and cut backbone out in one piece. Two or three hours later rub over flesh side about 2 lb. salt, $\frac{1}{4}$ lb. saltpetre, and a teaspoonful carbonate of soda. Let stand overnight, then turn skin side up for a few hours to drain, then rub in two parts fine salt to one of moist brown sugar. The meat should be turned every day for a week, and rubbed every other day with the salt and sugar. The meat can remain in salt for 14 to 21 days, and hams and shoulders should be pressed by using weights on them. In turning, always put meat that is on top to-day at the bottom to-morrow. When sufficiently salted wash with hot water (three parts boiling to one of cold) by dipping a towel or rag into a bucket and washing the meat. Don't dip the meat in the hot water, as it will melt the fat. Then soak in clean cold water for ten hours. The hot water takes the fat off the outer surface, and the cold water the excess of salt, which must necessarily be there to ensure the salt penetrating to the bone or centre of meat. Then hang up in a draughty place to dry, and if the sun is not too hot the meat will be better for the smokehouse if it is exposed to the mild sunshine for a few hours. In smoking always keep the meat cool. This can be done by having a furnace some distance from the smokehouse, and connected by a flue. At the same time, keep a very small fire (covered) in the house. This will keep the house dry, and prevent the meat from getting damp with the moist smoke from flue. When smoked sufficiently hang up again to dry, then polish with vinegar and salad oil, using plenty of vinegar on flesh side, as the flavour from vinegar is much appreciated by most bacon-eaters.

Port Elliot, September 17.

PRESENT—Messrs. McLeod (chair), Brown, Pannell, H. and H. B. Welch, W. E. and W. W. Hargreaves (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress and visit to Roseworthy College. Members expressed their pleasure at being able to take part in the recognition of Mr. Marshall's services to the State in connection with the introduction of rust-resisting wheats.

ACREAGE REGISTERS ON DRILLS.—Discussion took place on the accuracy of the acreage registers on seed drills. Members thought that where the ground was rough they were none too reliable. There was also considerable variation in respect to the seed, much depending upon the sample of grain sown.

Caltowie, August 22.

PRESENT—Messrs. Royal (chair), Hewett, Graham, Kerr, Petatz, Jettner, A. and J. McCallum, McDonald, Neate, Moore, Potter, and Lehmann (Hon. Sec.), and seven visitors.

QUESTION BOX.—A number of questions were asked through the box, and some interesting discussions ensued. *Stallion Tax*.—With the exception of Mr. Graham, who feared that it would increase the fee for service, members favoured the imposition of a tax on stallions. *Open Bridles*.—Members considered winkers preferable to open bridles for ordinary work. *Weeds on Fallow*.—It was agreed that in cleaning the fallow feeding off with sheep and surface cultivation were both necessary. *Membership of Branches*.—Members were in favour of increasing the present limit of membership to 20.

Reeves Plains, August 26.

PRESENT—Messrs. Folland (chair), Cosden, Richter, Alexander, Arnold, Worfel, R. and W. Oliver, Carrol, W. and H. Day, George, and McCord (Hon. Sec.), and number of visitors.

ANNUAL MEETING.—This being the annual meeting, it took the form of a social gathering at the Chairman's residence, a large number of visitors being present. Cricket and other amusements were indulged in during the afternoon, and music and singing in the evening. A hearty vote of thanks was accorded to the Chairman for his hospitality. Members expressed the opinion that an occasional gathering of this character would largely assist in bringing the residents together, and would be mutually beneficial to all concerned.

AGRICULTURAL SHOWS.—Mr. Winton forwarded a paper on this subject to the following effect:—The question as to whether the manufacturers and producers are benefited by the multiplicity of shows held throughout the State is one worthy of the serious consideration of all parties interested. When they saw almost every town of any importance, and some of no importance whatever, holding their annual show, and, as not infrequently happens, two or more of these on the same day, they would be pardoned for asking where the benefit comes in. If the manufacturer be represented at even a fair proportion of the shows he has to get up at least half a dozen sets of implements and machinery in show order and to have the same number of experts in attendance, to say nothing of the labour involved in getting his exhibits to and from the various showgrounds. Add to this railway freights, or, as in the case of a large number of country shows, haulage by road, and it is easily seen that the expense runs into something enormous. One gentleman, the head of one of their largest agricultural implement establishments, assured him that to make a very moderate display at the Adelaide Show cost him, at the lowest calculation, £20, and he was very positive in his assertion that he very rarely did any direct business on the showground. Under such circumstances he was compelled to put a higher price on his goods. It would be well for the producer, who has to purchase these goods, to keep this fact well in view when he is inclined to grow enthusiastic over the running of his own pet local exhibition. The same thing in a lesser degree applies to exhibitors of agricultural produce and live stock. It is not an altogether uncommon sight to see an exhibitor of poultry packing up his coops at the conclusion of one country show and driving off through the night a distance of twenty miles or more in order to be in time for another day's "crow and cackle" at the next town. One very unsatisfactory feature in connection with country shows is the appointment of judges. It is a very common practice to appoint some well-to-do farmer, a good man and true, no doubt, but whose only claim to the position is based on the fact that he has subscribed liberally to the funds of the society. This man, or a plurality of him, has no hesitation in adjudicating upon the merits and demerits of the various implements and machines entered in, say, Class A. He will even go to the length of saying which is the best twinebinder or complete harvester on the ground, although he may have no other means of arriving at a definite conclusion than that gleaned from the voluble explanations of the glib-tongued man in charge. Let them now pass on to Class B, which includes all the various vehicles turned out by the coachbuilder—buggies, phaetons, dog-carts, etc. They turn up the prize-list, and find, "Judges, same as Class A." And this worthy man gives his verdict with less hesitation than would be felt by an expert who had passed the greater part of his life in the trade. The writer has a very vivid recollection of a certain country show, which for obvious reasons should be nameless, where four judges were hopelessly divided as to the relative merits of two strippers. After a considerable amount of argument they agreed to, what? toss a penny! And thus was decided by the chance turning up of a head or tail which was the better machine. This must, of course, be very encouraging to a manufacturer whose exhibit is the result of years of practical experience and careful study. Let them turn now to the draught stock. In stallions they notice two, or perhaps three, competitors. One is selected by the judges as being superior to anything else on the ground. Within the next few days the same animals are competing for championship honours on the neighbouring showground, and the chances are that the positions are reversed, and the proud possessor of the blue ribbon of yesterday finds himself in the humiliating position of being nowhere to-day. His opinion was that as an annual holiday,

and as a time of re-union of old friends from all part of the district, and lastly as a means of gathering some of the loose cash into the coffers of the local tradespeople, the country show is a splendid success. But, looking at it from an educational point of view, he could not but think that it fell far short of expectations. He would suggest that about four shows should be held outside of the city, that is, in the most important centres of the North, North-West, South, and South-East, and that none but thoroughly practical men be appointed as judges, even should it be necessary to pay them for their services. He noticed that many of their leading manufacturers and importers were realising that the thing was being very much overdone, and he was confident that a majority of those would be conspicuous on the various show-grounds by their absence.

Yorke town, September 17.

PRESENT—Messrs. Correll (chair), Koth, Jung, Domaschenz, C. and A. E. Anderson, and Newbold (Hon. Sec.).

CULTIVATION OF SALTY LAND.—Mr. Domaschenz read paper dealing with his experiments with salty soils. In the May, 1903, issue of *The Journal of Agriculture* a paper read by himself at their meeting was published. Afterwards he was asked by the Inspector of Fertilisers to carry out some experiments for the Department on this land. A small block was accordingly fenced off, the land ploughed while damp, and thoroughly worked. Seeds of several kinds of saltbush, mangolds, and kale were sown on this block. The seeds germinated fairly well, and the plants grew much better than he expected through the summer. In April of this year he pulled out the mangolds, some of which weighed up to 12 lb. each. The kale and saltbush grew to a height of 3 ft., an annual variety of saltbush reaching 5 ft. The saltbush had done better on this land than on good soil. This year another plot of land selected by the Inspector of Fertilisers was broken up on June 2 and enclosed. The land was treated in different ways, and kale and rape sown on different parts. The rape came up splendidly, and was growing well. The kale has not come on like the rape, but will do better during the summer. The land that was under experiment last year was this year sown to wheat and barley with different manures. Both came on well, and are now doing splendidly. The wheat is doing better on the salty spots than on the patches which are less salt. His experience in the treatment of this land was that it should never be worked dry; it should be well soaked before it is cultivated in any way. It was decided that next meeting be held at Mr. Domaschenz's farm, to inspect the plots.

STANDARD BUSHEL.—Members are unanimously of opinion that it was very unwise to agitate for a 60-lb. standard. Having regard to various aspects of the matter, they thought a fixed standard of 62 lb. or 63 lb. would be best, and that the farmer should receive a proportionate increase per bushel for wheat over standard, as well as submitting to a reduction in price for wheat not reaching the standard.

Booleroo Centre, September 20.

PRESENT—Messrs. Brooks (chair), Nottle, Repper, Sargent, Michael, Murdoch, Albinus, and McMartin (Hon Sec.), and one visitor.

STANDARD BUSHEL.—Members were generally much dissatisfied with the present state of affairs as regards the f.a.q. standard under which wheat was sold, holding that the farmers are too much in the hands of the merchants. A resolution favouring the Agricultural Bureau being represented when the standard for the year is arrived at was carried. Mr. Michael wished to know whether the standard for the season was fixed at the weight of the average of the samples sent to the Chamber of Commerce, or were these only used as a guide? [This question is answered in the speech of the Chairman of the Corn Trade Section of the Chamber. See report of Congress.—Ed.]

Kingscote, September 12.

PRESENT—Messrs. Turner (chair), Bell, Melville, Wright, Olds, Davis, Nash, and Cook (Hon. Sec.).

CONGRESS.—Mr. Melville reported on proceedings of Congress. Dealing with the paper on lucerne, he said Mr. Cowan appeared to regard this as an easy plant to rear; but his own experience was that the land must be well worked prior to seeding. It should be fallowed, and cultivated two or three times, and the seed sown early.

SHEEP.—Mr. K. Nash read a paper on this subject. His experience, which extended over 30 years with sheep, was that right through the State the Merino were the most suitable breed to keep, as they required less feed and were hardier than other breeds. Besides, they were easier to keep in the paddocks than the longwools. Most sheepowners start breeding from two-tooth ewes, and while no harm might result, he thought it better to wait a little longer, especially with stud sheep. This, however, largely depended upon the breed, as some mature much earlier than others. He preferred the large-framed Merino ewe, which could always be secured; but if they went in for crossbred or comeback ewes they might find themselves confronted with a difficulty in procuring them at times. For fat lambs he would mate the ewes to Shropshire or Dorset Horn rams. Too much stress could not be laid upon the necessity for strong constitutions in both parents. The sire must be the best the farmer could buy. He found he got a better percentage of lambs when he yarded the sheep at night. While twin-births to a large extent depended upon the breed, he thought more depended upon the feed; flush of feed when the rams were with the ewes would result in a greater percentage of twins. Mr. Davis said he found the two-tooth ewes did not do so well after lambing as the older ewes. This season from 120 ewes he had 165 lambs, all but 15 of which were alive. He attributed this result largely to the fact that there was an abundance of barley on the ground when the rams were with the ewes.

Boothby, August 30.

PRESENT—Messrs. Whyte (chair), Foulds, Way, Henderson, Gillings, M. and F. Leonard, Bradley, R. and J. Carn, MacGowan, and Turnbull (Hon. Sec.), and about 50 visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. F. Gillings, there being a large attendance of members and friends. After conclusion of Bureau business, the evening was spent in social pleasures, a hearty vote of thanks being accorded to the host and hostess for their kindness.

STANDARD BUSHEL.—Members were of opinion that a fixed standard of 62 lb. per bushel would be a fair average.

MODERN HAMES.—Mr. Foulds initiated a discussion on this subject. He thought improvements could be effected in the fastening of the hames. He had often found some difficulty in adjusting the ordinary make of hames to the collar, especially with tall horses. If they could adopt some method of fastening the hames beneath the collar, instead of having to buckle them on top, it would be an improvement. Possibly some lever or clasp attachment would enable the hames to be adjusted with ease and celerity.

FORMALIN FOR PICKLING WHEAT.—The Hon. Secretary reported having sown wheat pickled with formalin and with bluestone side by side; but he could not see any difference in the germination or growth, one lot being just as vigorous as the other.

RAISING CHICKENS.—Mr. Carn read a paper on this subject. The hen should be set in a secluded place, making a nest on the ground and putting a little soft straw or dry grass in it. Early in the season nine or ten eggs will be enough to place under the hen; but when it gets warmer the number may be increased. Care should be taken that the hen comes off every day for food and water. While she is off, wash in lukewarm water any dirty eggs. Do not disturb the hen for the last day of incubation, except to remove the empty shells. When the chicks are 24 hours old, remove them with the hen

to a suitable coop, which should be supplied with sawdust or litter for them to scratch in. Give the hen some food first, then give the chicks their first meal. This may consist of bread-crumbs mixed with hard-boiled egg. It is important that the hen and chicks should be in a quiet spot, as if the former is hurried she may trample some of the chicks to death. He strongly favoured the light Brahma as a good all-round farmer's fowl. They were good layers, good table birds, easily kept in confinement, and, when allowed to roam about do not do so much mischief in the garden as the lighter breeds. Neither do they acquire the bad habits of feather-eating and egg-eating. The Chairman favoured the White Leghorn for farmers; while Mr. Way stated that he found the cross between the Langshan and Malay game hard to beat for laying or table purposes.

MEMBERSHIP.—Members do not approve of Wilmington proposal, that one-third of the members of each Branch should retire annually; but favour the adoption of the principle of honorary membership.

Lyndoch, September 22.

PRESENT.—Messrs. Kennedy (chair), Rushall, Warren, Rhen, Kluge, Burge, Schenke, Mitchell, Zimmermann, Arthur, Alfred, H., and E. Springbett (Hon. Sec.), two hon. members, and one visitor.

CONGRESS.—Delegates to Congress reported on proceedings, and regretted that owing to the alteration made in the agenda paper they were unable to bring forward the subjects submitted by the Branch. A resolution expressing disapproval of the alteration of the Congress programme after the agenda papers had been sent out was carried.

PRUNING OF FRUIT TREES.—Mr. James Woolcock forwarded paper on this subject. The object of pruning was to produce a strong, evenly balanced tree, bearing fruit of good quality, distributed evenly over the tree, and in such position that it can be easily gathered. In their climate fruit trees were naturally prolific, and the pruner must usually reduce the fruit wood to reduce the burden on the tree. If this is done, the necessity for thinning the fruit to secure a large sample is to a large extent obviated. If the tree runs entirely to wood, root pruning or summer pruning must be resorted to. Root pruning must be done during the winter months. Run a trench around the tree at a distance of about 4 ft. from the trunk, and cut the roots. With old trees he would advise doing one side one year and finishing the circle the following winter. Where deep ploughing is practised root pruning is not likely to be required. Close pruning during the dormant season induces wood growth, hence weakly trees should be cut back to a healthy bud. Checking the flow of sap during the growing season results in the formation of fruit spurs. Pruning while the tree is in bloom will cause the fruit to set. With plums, prunes, and apricots, all the small spurs along the branches should be left, and the tree headed in well, to cause fruiting along the main branches. Apples, peaches, and pears should be cut well back during the winter to give shape and strength to the tree, and also to prevent premature fruiting, an evil which is not properly recognised by most growers. Apples and pears should be headed back when planted to from 20 in. to 24 in., and three or four of the shoots that start selected to form the main arms, care being taken that they are evenly balanced. In pruning the main arms those varieties which grow erect should be cut to an outside bud, while for those of spreading habit the top bud should be on the inside of the shoot. If this practice is followed the tree can be made to assume an upright growth. On no account be in a hurry to get a large tree. Hard cutting for two or three seasons will give strength to the tree, and summer pruning afterwards will soon give fruit. Apricots must be cut hard back for several years after planting, and care must be taken to secure at least three main branches from the trunk. As each season's growth is more or less furnished with laterals, besides shortening in the leaders these laterals must be cut back to about 5 in. to convert them into fruit spurs, which will bear the following season. Summer pruning, done after the fruit is gathered, will be found beneficial. The plum requires but little pruning after it comes into bearing, and unless the tree becomes top heavy summer pruning will not be of much use. The peach and nectarine also require hard pruning to secure a strong

trunk with stout arms. Severe winter pruning after it comes into bearing is also necessary if good fruit is to be obtained. There was no risk of cutting too hard, as if planted in rich soil at least three-fourths of the annual growth could be removed, and then thinning of the fruit will be necessary to secure extra large fruit. It was a great mistake to allow the trees to fruit too early. Neglect to thin was also a mistake, as, if allowed to overbear, the trees soon become weak and sickly. Worn-out trees with healthy roots can be cut hard back and new top soon secured. Plenty of light should be let into the middle of the peach tree by summer pruning, and it should be the grower's object to induce the formation of laterals on the main branches, as these will carry the best fruit. Specimens of apricot trees supposed to be affected by some new disease were tabled. These were sent to Mr. Quinn.

WEED.—Mr. Alfred Springbett tabled bulb with long, narrow leaves and orange-coloured flowers. [This is one of the *Homeria*; it is poisonous, and is included in the list of noxious weeds. A variety of this *Homeria* was illustrated in the September, 1903, issue of *The Journal of Agriculture*.—Ed.]

Mount Gambier, September 17.

PRESENT—Messrs. Watson (chair), Wedd, Ruwoldt, Mitchell, Barrows, Wilson, and Collins (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress, and commented on the absence of discussion on matters of interest to the South-East. The resolution in favour of removing the present limitation of membership met with general approval, and it was decided to ask whether the Branch could proceed to give effect to the resolution. [No; until the Council of Agriculture decided otherwise, the membership cannot be increased beyond the present limit of fifteen.—Ed.] Some discussion took place on Professor Perkins's address on experimental work, and on his articles on the South-East, appearing in *The Journal of Agriculture*.

Renmark, September 22.

PRESENT—Messrs. Showell (chair), Johns, Cole, Ogilvy, and Evans (Hon. Sec.), and two visitors.

CONGRESS.—The Hon. Secretary reported on proceedings of Annual Congress.

CO-OPERATION.—The Hon. Secretary read a short paper on the necessity for co-operation in respect to the disposal of their produce. The chaotic condition of the raisin market consequent on the dissolution of the Australian Dried Fruits Trust emphasised the necessity for some organisation to control the disposal of their products, as some efficient means of dealing with the surplus over local requirement was essential to their industry.

Wilmington, September 21.

PRESENT—Messrs. Robertson (chair), Maslin, Slec, Bauer, Hannagan, Schuppan, Noll, Broadbent, McColl, Sullivan, Lauterbach, and Payne (Hon. Sec.), and a number of visitors.

HOMESTEAD MEETING.—This meeting was held at Mr. J. Schuppan's residence, Spring Creek, there being a large attendance of members and friends. The outbuildings, stables, and chaffshed came in for special notice on account of their substantial nature and convenient arrangement. The fruit and vegetable garden was inspected, and some criticism on the pruning of the fruit trees and vines was offered. The cereal crops were generally healthy and promising, only requiring seasonable rain to ensure a good return. A little rust was noticed on the flag of the wheat. The visitors were entertained at

tea by Mr. and Mrs. Schuppan, and after the conclusion of formal business music and other amusements were indulged in. A hearty vote of thanks was accorded to Mr. and Mrs. Schuppan for their hospitality.

CONGRESS.—Delegates to Congress reported on proceedings. Mr. Robertson took strong exception to the voting on his motion in reference to the alteration of the constitution of the Bureau. He considered those members who voted for the amendment, viz., for unlimited membership, and who were delegates from Branches which had previously carried resolutions in favour of the Wilmington proposals, were false to their trust. The amendment which was carried by the Congress required the approval of the Council of Agriculture before it had any effect. He considered the proposal for unlimited membership quite unworkable. Members of the Branch were unanimous in expressing dissatisfaction at the manner in which their proposals for an alteration in the constitution of the Bureau had been treated by the Council of Agriculture and at Congress.

Orroroo, September 23.

PRESENT—Messrs. Moody (chair), Roberts, Brown, Dunn, Robertson, Lillecrapp, and Tapscott (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Annual Congress, and some discussion ensued.

STANDARD BUSHEL.—Mr. Robertson strongly advocated the adoption of the system of grading wheat, and the payment according to quality.

Narridy, September 24.

PRESENT—Messrs. Smallacombe (chair), Flavel, Smart, Kelly, Hodge, Darley, and Dunsford (Hon. Sec.).

CONGRESS.—The Hon. Secretary reported on proceedings of Annual Congress, and some discussion took place on the growing of lucerne and the use of the harvester. While members agreed that lucerne would do better and last longer on rich land with water fairly close to the surface, they were of opinion that on land less favourably situated proper preparation of the land and good cultivation would prolong the profitable life of the plant. Doubt was expressed as to the complete harvester being suitable in hilly country.

Stockport, September 26.

PRESENT—Messrs. Godfree (chair), Watts, Howard, Smith, and Murray (Hon. Sec.).

VISIT TO AGRICULTURAL COLLEGE.—It was decided to write to the Principal of the College to arrange for a visit by members of this Branch. Paper read at Saddleworth Branch by Mr. F. Coleman on "Power on the Farm" was read and discussed.

Port Broughton, September 24.

PRESENT—Messrs. Tonkin (chair), Button, Whittaker, sen., Whittaker, jun., Evans, Hear, Barclay, Harford, and Dalby (Hon. Sec.).

CONGRESS.—Delegates to Congress reported at length on proceedings of Annual Congress.

Morchard, September 24.

PRESENT—Messrs. Toop (chair), Kupke, Reichstein, Martin, Kitto, Kirkland, O'Loughlin, Bull, Barrie, and Beck (Hon. Sec.), and three visitors.

CONGRESS.—Delegates to Congress reported on proceedings. Members thought farmers should insist on wheatbuyers using Mark lane testing scales for weighing wheat, instead of the small scales now used.

WOOL-CLASSING.—Mr. Barrie read a short paper on this subject. He did not think it would pay any one with less than 500 sheep to class his wool, as the lots would be too small to attract buyers' attention. Any coarse and discoloured fleeces should be kept separate from the clean fleeces, however small the clip.

Hartley, September 23.

PRESENT—Messrs. Wundersitz (chair), Reimers, Klenke, Jaensch, Stanton, Kutzer, Hassam, W. and C. Brook.

HON. SECRETARY.—Mr. C. Brook was appointed Hon. Secretary, in place of Mr. Fry, who resigned.

STOOKING HAY.—Discussion on this subject took place. Members were of opinion that a stook four sheaves in width, and with ends facing east and west, was the best.

COMPLETE HARVESTER.—Considerable discussion on paper read at Congress took place. Members agreed as to the importance of the warning against reaping and bagging the grain while green and damp.

Dowlingville, September 23.

PRESENT—Messrs. Mason (chair), Montgomery, Foggo, Phelps, Whittaker, Grave, and Lock (Hon. Sec.).

CONGRESS.—Mr. Phelps reported on proceedings of Annual Congress, and some discussion on the grading of wheat took place. Some of the members thought that the adoption by the buyers of two grades would induce farmers to clean their wheat better in order to obtain top rates. This would soon result in a marked improvement on the average sample of South Australian wheat.

Gawler River, September 23.

PRESENT—Messrs. H. Roediger (chair), F. Roediger, Bray, Kreig, Baldwin, Winckel, Hillier, Day, and Leak (Hon. Sec.).

CONGRESS.—The Chairman reported on proceedings of Congress, and some discussion took place on the standard sample of wheat. It was resolved that this Branch suggests that in future wheat weighing less than the standard should be docked 1 lb. per bushel in weight for every pound under, instead of the present system of docking 1d. per bushel. Members invite other Branches to discuss this suggestion and to co-operate to bring it into operation.

IRRIGATION.—Mr. A. Bray initiated a discussion on this subject. Dealing with the raising of water from wells, he considered the oil engine the best motive power, as the grower could always rely upon obtaining sufficient water within a short time to give the land a good soaking. The quality of the water used must be the first consideration, as the use of water of an inferior quality is likely to prove disastrous. When irrigating fruit trees a thorough soaking should be given, as the loss from evaporation was much less than from a light watering. For oranges three good soakings during the season will be sufficient. Winter irrigation was favoured, as with a proper system of cultivation it would prove sufficient to carry the trees through the summer. Members agreed that frequent light waterings would have a tendency to bring the roots of trees close to the surface. With open, light

soils more frequent irrigation was necessary than with firm land. If the land can be watered towards evening there would be less loss by evaporation than earlier in the day.

LUCERNE.—Discussion on lucerne growing took place, and it was agreed that for broadcast seeding 10 lb. per acre was necessary. The seed should be sown as shallow as possible. In reply to enquiry *re* lucerne "flea," Mr. Hillier said that he got rid of it on his lucerne by giving the land a good flooding.

Inkerman, September 22.

PRESENT.—Messrs. Daniel (chair), Lomman, Smart, Mugford, Board, Kennedy, Williams, F. I., and F. C. Smart (Hon. Sec.) and three visitors.

CONGRESS.—Mr. Mugford reported on proceedings of Congress, and some discussion ensued.

BACON-CURING.—Mr. Board read a short paper on this subject. He found the Poland-China pig, crossed with the Essex or Berkshire, made very good baconers. A good flagstone, set about 2 ft. from the ground, makes a very convenient table for working on when treating the pork. A groove along one edge should be made to carry away the brine to a convenient vessel. The meat should be well rubbed every day with a mixture of salt and saltpetre, at the rate of 1 lb. of salt to 1 oz. of saltpetre. After the second rubbing omit the saltpetre. If the meat is dry add a little brown sugar to the salt. For pigs weighing 100 lb. to 130 lb. this treatment must be continued for about two weeks with bacon and a week longer for the hams and shoulders. The meat should then be washed, rubbed dry with a soft cloth, and then hung.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from August 29 to Sept. 26, 1904.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	36	98	245
Masons and bricklayers	—	2	3
Carpenters	1	1	3
Blacksmiths and strikers	1	—	—
Fitters and turners	—	—	2
Brassfinishers	—	—	3
Electrician	1	—	—
Plumber and ironworker	—	—	1
Painters	4	—	1
Warders	1	—	—
Apprentices	6	3	2
Cleaners	1	2	—
Porters and junior porters	10	6	3
Rivet boys	2	—	—
Totals	63	112	263

September 29, 1904.

A. RICHARDSON, Bureau Clerk.





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VOL. VIII.

UTILISATION OF SALT LAND.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

At the March (1903) meeting of the Yorketown Agricultural Bureau, Mr. C. Domaschenz read a short paper dealing with the cultivation of alkali soils. In view of the large area of land in Southern Yorke Peninsula which, owing to the excess of alkali, would not grow cereals, the Department asked Mr. Domaschenz to undertake some experiments with different crops. These alkali soils may be roughly divided into two classes, viz., those that originally carried good crops of wheat, and those that have never grown cereals. The former are of comparatively recent origin. Formerly splendid crops of wheat were grown on this land; but since about 1889 the "salt" has risen to the surface over large areas, completely ruining the land for ordinary cropping. Most of the residents are agreed that the trouble dates from about 1890, and it is significant that the two succeeding winters of 1889-90 were very wet, the rainfall for the two years reaching 23.61 in. and 24.16 in., respectively, compared with the mean average of 17.97 in. Water lay about in many of the depressions throughout the summer, the ground being apparently saturated. The explanation that strikes one at once as the possible cause of the rise of alkali is that, owing to excessive evaporation following the two wet seasons, the soluble salts were brought from a considerable depth and concentrated in the surface layers of soil. All through the lower Peninsula there are numerous so-called "salt lakes." These are depressions generally somewhat circular in shape, sloping on the one side, and with somewhat precipitous banks on the other. They receive the surface drainage waters during the winter; but with the advent of hot weather this evaporates rapidly, leaving in many of the lakes a thick crust of salt (sodium chloride) of good quality, while in others a thick, sticky, black mud remains. Since the wet seasons referred to quite a number of these lakes, which were formerly useless, have produced good crops of salt. These lakes vary from an acre or two in area to large-sized bodies of water. In most cases, so far as came under my notice, the lower land approaching the sloping side of the lakes is covered with samphire (*Salicornia arbuscula*) and salt grass (probably *Distichlis* sp.), with occasional patches devoid even of these plants.

In dealing with land that formerly carried good crops of wheat, Mr. Domaschenz's experiments demonstrated that tillage when the ground was wet resulted in a fair crop of wheat; while dry tillage was a complete failure. Mr. Domaschenz's view is that working the salt soil wet resulted in the injurious salts being washed into the lower strata—an idea that is probably well founded. Any improvement in this way, however, can only be of a temporary character, as the salts will rise again to the surface as evaporation proceeds. In our August, 1903, issue, Professor Perkins dealt at some length with the

chemical analyses of the salt patches on Mr. Domaschenz's holding. The tables given therein show the quantities of the various salts per acre, and it will be noted that the bulk of the injurious salts is sodium chloride, or common salt. Both classes of soil were found to be heavily charged with common salt, the land near the lakes being particularly so. Sodium carbonate and magnesium sulphate also show to a greater extent in this land. Analyses also showed that this land was rich in potash (1 per cent. to 1.33 per cent.), fairly so in nitrogen (0.14 per cent. to 0.23 per cent.), but, as usual with our mallee districts, low in phosphoric acid (0.062 per cent. to 0.068 per cent.).

In 1903 Mr. Domaschenz fenced off a block of land close to a large salt lake and adjoining the land on which he had carried out his experiments with wheat. Part of this was carrying barley grass, while some of it had never previously been broken up. Plants of mangels and kale and seeds of saltbush were supplied by the Department, together with some mineral super, to sow in this block. The work, however, was started too late in the season, the plants arrived in poor condition, and an unfortunate illness prevented Mr. Domaschenz from working the ground to prevent its setting on the surface. The results, however, in December, when I had an opportunity of inspecting the plots, were sufficient to warrant further experiments. In places the kale had made good growth, and the mangels were promising well. Of the saltbushes an annual variety, known locally as "Victorian saltbush," was growing freely, while several other varieties were only just starting. Generally the growth on the plot was too variable to enable me to come to any definite conclusion as to the probable commercial value of the crops. By the end of the summer the kale in places was 3 ft. high, some of the mangels weighed 12 lb., while the saltbush was 2 ft. to 5 ft. in height. On the occasion of my visit another block of land that had never been broken up, and was closely covered with samphire and salt grass, was selected for further experiments. This will be referred to as Block B, and the first plot as Block A.

Early in May, 1904, Mr. Domaschenz cleared away all the vegetation left on Block A, transplanting the saltbush to one corner. The land was cultivated when wet, and half the block dressed with 2 cwt. per acre of sulphate of potash, the object being to render certain of the salts innocuous, if possible. On June 14 half the block was sown to barley and half to wheat, with 1 cwt. of super per acre. Half of the area under both wheat and barley was also top dressed with nitrate of soda at the rate of 1 cwt. per acre. This made a decidedly expensive dressing, but our object was to determine whether any beneficial results would accrue from such treatment. Mr. Domaschenz reported that on the whole the crops made fair progress up to the middle of September, when, with the exception of some of the hollows, where the water collected during the winter, causing the plants to go yellow, the wheat promised a fairly good return. Very little rain fell from the beginning of September to the middle of October, and the drying winds played havoc with the plots, stunting the growth of the more backward portions, and blighting the ears. On October 15, in company with members of the Yorketown Bureac and several visitors, I inspected the plots. Some of the wheat and barley had stood the trying weather splendidly, and was well out in ear, but quite half the area was very poor. The most satisfactory feature, however, was the quantity of young saltbush plants growing amongst the cereals. On the small portion, where these seeds were sown last year, and immediately around, there were many hundreds of healthy young plants, which will in all probability cover a considerable portion of the land later on in the season. The Victorian saltbush was very promising. This makes very rapid growth several feet in height, with long, thick, bright green leaves, and is, I am told, readily eaten by stock. The transplanted saltbushes were also doing well. The following were the varieties tested:—*Atriplex vesicarium*, or Bladder saltbush. This is a dwarf, spreading saltbush, with rather fine stems and small leaves. Several of the plants were nearly 2 ft. across, and were covered with small, bladder-like seed vessels. Around these plants and beneath them this seed could be gathered in handfuls, and a number of the visitors were so favourably impressed with the growth of the bush that they gathered a quantity of seed for sowing on their own land. The creeping saltbush (*Atriplex semibaccatum*) was just starting to cover the ground and was growing vigorously. This has very fine stems and small leaves, and is valued very highly in California on account of the immense quantity of feed it produces. Both for hardness, bulk of fodder, and for its high nutri-

tive ratio it is considered superior to any saltbush yet tried on the alkali lands of California, where hundreds of acres of it have been grown. It is cut with a mower and made into hay. Cattle and sheep are very fond of this variety, either fresh or cured. *Atriplex halimoides*, a perennial, bushy saltbush, with stouter stems and leaves than the other two, was making a good growth. *Atriplex nummularia* (giant saltbush) was about 2 ft. in height and growing vigorously. This is one of the largest of our saltbushes, reaching a height of 6 ft. to 10 ft. under favourable conditions, the leaves being broad and fleshy. Some distance outside the fence stray plants of the different kinds of saltbush were to be seen here and there, and I have little doubt that if left undisturbed a considerable area of the surrounding land would soon be covered with these valuable fodder-producing plants. Some of the visitors expressed the opinion that if the saltbushes would grow as well on other parts as they did on the experimental block their salt soils would soon be nearly as valuable as the best wheat-producing areas.

Some few mangels that had been left over from last year were of large size. Of the two varieties tried, long red and yellow globe, the latter had done better. At the Yorketown Show Mr. Domaschenz carried off first prize with some splendid mangels grown on these plots.

Block B was devoted to rape and kale. Seed of both was supplied by the Department, but unfortunately we did not send sufficient rape seed, consequently Mr. Domaschenz had to purchase a quantity locally. Half of the plot was first dressed with sulphate of potash. Seed was broadcasted on June 2, with mineral super at the rate of 10 lb. rape and 1 cwt. super per acre. A heavy application of seed was made, as we feared the excess of salt would probably interfere with the germination. On the portion sown with seed we supplied the rape was very thick and vigorous, completely covering the ground. It was generally agreed that the result would have been much better if less than half the quantity of seed had been sown, as the plants were too crowded. Where the seed procured locally had been sown the contrast was striking. Three different lots were purchased. Two germinated very badly, and the land was re-sown later with fresh seed. The third lot germinated fairly well, but there could have been very little rape, the plants that grew being harsh, and more like the wild turnip than like rape. The kale seed was sown in drills 2 ft. 6 in. apart, at the rate of 3 lb. per acre, together with 1 cwt. super per acre. In most places the plant had come up well and was thriving, but it was too early to come to any conclusion as to the ultimate result. If the plant will stand the dry weather in this salt land as it does under average conditions, I am satisfied that the plot will produce a large amount of fodder during the latter part of the summer and early in the winter. One advantage of kale is, of course, that it will last for two years. In this block a few plants of saltbush had recently been set out where the rape had failed, and these were just starting to make new growth. It was impossible to detect on either of the plots any benefit from the application of the sulphate of potash. Taken altogether, the results of these experiments were very satisfactory. There are many thousands of acres of these salt lands on the Peninsula, and if such crops as rape, kale, mangels, and saltbush can be profitably grown thereon, it will mean that the carrying capacity of the holdings will be considerably increased. It is intended to continue our experiments during the coming season, and arrangements will be made to put a block of two or three acres into saltbush to test the carrying capacity of this plant in conjunction with the stubble paddocks. After having made a very careful inspection of the plots, the visitors discussed the results, and it was unanimously resolved:—"That in the opinion of the Yorketown Branch the results of the experiments carried out by Mr. Domaschenz demonstrate that these salt soils can be profitably utilised."

EXPERIMENTAL WORK IN AGRICULTURE.

ADDRESS BY PROFESSOR PERKINS.

At the Annual Congress of the Agricultural Bureau, held during September Show week, Professor Perkins, Principal of the Agricultural College, delivered an address on the above subject:—

He would place before them matters to which he had given some thought lately, and he was of the opinion that the particulars might be interesting to them and agriculturists generally. The subject of experimental work had been brought before the Agricultural Bureau on various occasions, but the work, as far as he knew, had been practically limited to the acclimatisation of different crops. That was one form of experimental work, but when once it had been ascertained what could be grown profitably under our conditions, there arose many other difficulties that could be settled by continuous experimental work. During the latter half of the past century a good deal of attention had been paid in various countries to experimental work on the farm. The experiments were practically all carried out under State supervision, but he did not know of a better example of this work than that performed by private enterprise in Great Britain. He referred to the work undertaken by Lawes & Gilbert, the names of whom should be familiar to all agriculturists. He was afraid that what they had done, although it had been placed on record in numerous documents, was not, in a sense, available for the majority of those whom it was intended to assist. To us Lawes & Gilbert's work was of special significance in connection with certain points bearing upon our agriculture. At the same time the documents in which the work was recorded formed very dry reading, and he doubted if more than one in a thousand of those persons who should read them would ever do so. It was the duty of those who could give the time to mastering the dry details to summarise them briefly for the benefit of those who carry the lessons into everyday practice. There was a tendency to-day to go over and over again work that had already been well done by others. Lawes & Gilbert had done much good work connected with experimental agriculture, and a knowledge of some of it would, perhaps, save us much trouble in our attempts at unravelling problems that have already received their solution at the hands of others. To-day he had selected a few typical examples from the labours of Lawes & Gilbert to give them a practical definition of what real field experimental work was. He assumed that the lines taken by experimental work would be dictated by the needs of the country in which it was undertaken; and if he quoted Lawes & Gilbert's work at all it was because their method of procedure could be copied with advantage by all countries alike. He had experienced difficulty in trying to place before them a proper representation of Lawes & Gilbert's work, which was presented in a series of tables, but he had secured the aid of a lantern to show them what was being done in the old country. The lanternist would show them the first table:—

TABLE I.

Rothamsted Experiments with Wheat grown continuously for 60 years in succession on the same land (1843-1903). Typical examples from 22 variously manured plots.

Plots.	Manures used.	Average of 51 years (1852-1902).	1902.
		Bushels.	Bushels.
2B	Farmyard manure, 14 tons, 1843 and since ...	35.7	41.5
3-4	Unmanured, 1844 and since ...	13.1	13.3
5	Superphosphate, 3½ cwt. ; sulphate of potash, 200 lb. ; sulphate of magnesia, 100 lb. ; sul- phate of soda, 100 lb. ...	14.9	15.5
6	Same as Plot 5, and 200 lb. ammonium salts ...	24.0	26.2
7	Same as Plot 5, and 400 lb. ammonium salts ...	32.9	38.2
8	Same as Plot 5, and 600 lb. ammonium salts ...	37.1	45.2

That table showed the results of work covering sixty years—that was to say that plots of land had carried crops sixty years in succession. Unless a

person worked on the same land year after year it would be impossible to tell what influence the variable seasons had upon the experimental work. He considered that experiments carried out on the same plot of land year after year would give a far more reliable average than those undertaken on different plots. In the first item of the illustration they would notice that the average return of wheat for fifty-one years, with the use of farmyard manure, was slightly over 35 bushels to the acre, which was a very good yield, while the return for the year at the end of that period, namely, 1902, was 41 bushels. It was rather astonishing to find that the yield of wheat from the plot that had not been manured for such a long period of years was as high in 1902 as 13.3 bushels to the acre, while the average of the same plot for fifty-one years was nearly the same. Messrs. Lawes & Gilbert point out that the average of their unmanured plot continuously under wheat was above the average yield of a good many countries. Their explanation was that in order to ascertain the effect of soil exhaustion they always kept their crops as clean as possible. It would be practically impossible to grow wheat any other way. In fact, the method they adopted was the only one demonstrating accurately to what extent continuous cropping exhausted the soil. In this direction weeds would do far more harm than exhaustion of plant food; that was their inference. The third item would show them that money could be expended on manures without giving practically any return. At the time the experiments were being conducted there was a big discussion going on in England as to the effect of nitrogenous manures on crops. They would see that a heavy dressing of superphosphate, sulphate of potash, sulphate of magnesia, and sulphate of soda, without nitrogen, gave very little return above that of the no-manure plot. In 1902 a crop sown with only mineral manures gave only about 2 bushels more than a crop that had no manures. Plots 6, 7, and 8 would show what a difference the addition of ammonium salts made. In 1902 the yields were 26.2, 38.2, and 45.2, and the averages for the plots with ammonium salts for the fifty-one years were correspondingly satisfactory. This table brought home to them the great importance of nitrogenous manures in England, and yet it had been repeatedly stated that they were without effect here. They had here one point alone opening out a problem of extreme importance, that could only be solved by continuous experimental work. Was it correct that a manure so powerful in its effects in Europe was valueless here, and, if so, why was this the case? They might argue over the question and offer all sorts of explanations, but experimental work alone could afford a satisfactory answer.

TABLE II.

Rothamsted Experiments on Manuring Barley, 52 years in succession on the same land (1852-1903). Typical examples from 24 variously manured plots.

Plots.	Manures.	Average of 51 years (1852-1902).	1902.
		Bushels.	Bushels.
6-1	Unmanured, 1852 and since	16.7	12.7
7-2	Farmyard manure, 1852 and since	47.6	42.4
2-0	Superphosphate alone, 1852 and since	20.1	21.7
4-0	Mixed mineral manures alone, 1852 and since	20.4	18.2
2AA	Superphosphate and nitrate of soda, 1852 and since	44.0	45.9
4AA	Mixed mineral manures and nitrate of soda, 1852 and since	43.5	36.5

Table II. showed experiments carried out with barley over a period of fifty-one years. Farmyard manure gave the fine average of 47.6 bushels, superphosphate alone had an average of 20.1, and mixed mineral alone about the same return. Superphosphate and nitrate of soda mixed, however, gave the splendid average of 44 bushels. In reply to questions, Professor Perkins said in respect to the only small increase by the use of superphosphate that Lawes & Gilbert were not aiming at a profit. They were trying to find the effect the manure would have. Of course, climate had a great deal to do with the amount of the yield. Similar experiments to these should be undertaken at the Roseworthy Agricultural College. He thought the average rainfall at Rothamsted was not more than 25 or 26 in., but, it being a colder climate, the rainfall would go much further than it would here.

TABLE III.

Rothamsted Experiments with Wheat after bare fallow, unmanured, compared with wheat grown continuously without manure for 53 years (1851-1903).

Averages—Produce after fallow reckoned at the yield per acre of the half in crop each year:—

				Wheat after Fallow.	Wheat after Wheat.	After *Fallow or after †Wheat.
				Bushels.	Bushels.	Bushels.
5 years (1851-55)	..	...	...	19·2	14·7	*4·5
10 years (1856-65)	...	...	...	26·1	15·9	*10·2
10 years (1866-75)	...	...	...	13·5	11·9	*1·6
10 years (1876-85)	...	...	...	14·8	11·3	*3·5
10 years (1886-95)	...	...	...	15·1	12·1	*3·0
40 years (1856-95)	...	...	...	17·4	12·8	*4·6
1902	...	...	...	22·4	13·3	*9·1

Averages—Produce after fallow reckoned at the yield per acre of the whole area half in crop and half fallow:—

				Wheat after Fallow.	Wheat after Wheat.	After *Fallow or after †Wheat.
				Bushels.	Bushels.	Bushels.
5 years (1851-55)	...	...	...	9·6	14·7	†5·1
10 years (1856-65)	...	...	...	13·0	15·9	†2·9
10 years (1866-75)	...	...	...	6·8	11·9	†5·1
10 years (1876-85)	...	...	...	7·4	11·3	†3·9
10 years (1886-95)	...	...	...	7·5	12·1	†4·6
40 years (1856-95)	...	...	...	8·6	12·7	†4·1
1902	...	...	...	11·2	13·3	†2·1

This experiment, said Professor Perkins, was undertaken to get at the result of the bare fallow. Where "wheat after fallow" was mentioned it meant that there was a crop on the land every other year, while in the case of "wheat after wheat" the wheat was grown year after year. The second portion of the table showed that the averages worked out in favour of wheat grown continuously; that is, that bare fallow before wheat was economically unprofitable. Of course, he was speaking of the conditions in England, not here.

TABLE IV.

Rothamsted Experiments with Wheat without Manure, on land that had carried various leguminous crops from 1878 to 1897.

Leguminous crops previously grown on same land.	Harvests.			
	1899.	1900.	1901.	1902.
	Bushels.	Bushels.	Bushels.	Bushels.
Lucerne	39·3	28·9	27·0	20·1
Peas or Beans	42·6	14·3	16·8	14·0
Bokhara Clover	43·7	16·4	20·1	15·6
Sainfoin	45·2	19·1	20·9	15·8
White Clover	43·5	19·3	21·4	17·9
Red Clover	43·0	19·1	21·4	17·7
Vetches	39·9	14·2	17·7	13·9

Whilst under leguminous crops these plots had been manured with nitrate of soda and mineral manures.

This table showed the lines that were followed for about twenty years to find the effect leguminous crops had upon other crops by putting nitrogen into the soil. Leguminous crops were grown for twenty years in succession, and then replaced by wheat from 1900 to 1902 inclusively. The wheat had no manure, and from 1899, when the start was made, to 1902, the yield was gradually going down. This illustrated that the fertility left in the soil was exhausted by very few crops of cereals. The leguminous crops were not ploughed in; the fertility in the soil was left by the roots alone.

TABLE V.

Rothamsted Experiments with Potatoes variously manured for 26 years in succession (1876-1901), followed by Barley unmanured in 1902.

Plots.	Manures applied to Potatoes per acre per annum.	Average produce of total Tubers per acre (26 years).	Barley unmanured, 1902.
		Tons.	Bushels.
1	Unmanured, 1876 and since ...	1.4	33.2
3	Farmyard manure, 14 tons, 1883 and since ...	4.8	71.0
5	Ammonium salts, 400 lb. ...	1.7	59.1
6	Nitrate of soda, 550 lb. ...	2.1	62.9
8	Nitrate of soda, 550 lb.; superphosphate, 3½ cwt.; sulphate of potash, 300 lb.; sulphate of soda, 100 lb.; sulphate of magnesia, 100 lb. ...	5.4	67.0
9	Superphosphate, 3½ cwt. ...	2.7	35.1
10	Superphosphate, 3½ cwt.; sulphate of potash, 300 lb.; sulphate of soda, 100 lb.; sulphate of magnesia, 100 lb. ...	2.9	24.8

Information was here given of the yields of potatoes grown successively for twenty-six years with the aid of different kinds of manure, and followed by crops of barley which received no manure. What would be interesting would be to see the yields of the barley some years hence. It was an average loamy soil. The climate might bring about conditions we in South Australia could not foresee.

TABLE VI.

Rothamsted Experiments with Mangels, 28 years in succession (1876-1903). Typical examples from 40 variously manured plots.

Plots.	Manures used per acre per annum.	Roots per acre.	
		Average of 27 years (1876-1903).	1902.
I.-1	Farmyard manure, 14 tons, 1876 and since ...	Tons. 17.44	Tons. 23.16
II.-1	Same as Plot I.-1, and 550 lb. nitrate of soda ...	24.74	38.64
I.-4	3½ cwt. superphosphate; 500 lb. sulphate of potash; 200 lb. common salt; 200 lb. sulphate of magnesia ...	5.36	7.45
II.-4	Same as Plot I.-4, and 550 lb. nitrate of soda ...	18.01	32.46
I.-5	3½ cwt. superphosphate ...	5.21	9.12
II.-5	Same as Plot I.-5, and 550 lb. nitrate of soda ...	15.40	27.04
I.-8	Unmanured, 1853 and since ...	3.91	5.35
II.-8	550 lb. nitrate of soda ...	10.24	18.99

This experiment with mangels extended over a long period. The best return was obtained from the plot where nitrate of soda was used with farmyard manure. It appeared from the figures throughout that the year 1902 must have been a most favourable one for mangels, and that was always the danger where short experiments were conducted.

Mr. H. Kelly asked if the Professor would recommend such a heavy dressing of nitrate of soda.

Professor Perkins said of course they must recollect that this was simply experimental work, to gain knowledge.

Mr. J. Miller asked if it were advisable to grow mangels on salt land?

The Professor replied that some had been grown on salt patches on Yorke Peninsula and on the Murray Flats. Some of the seed had not germinated; but where it had, the mangels had grown well.

TABLE VII.

Rothamsted Experiments on Manuring Permanent Grass Lands 48 years in succession (1856-1903). Typical examples from 20 plots variously manured.

Plots.	Manures.	Averages.		1902, 1st and 2nd cuts.
		20 years (1856-75), 1st cut only.	26 years (1876-1901), 1st and 2nd cuts.	
		cwts.	cwts.	cwts.
3	Unmanured, 1856 and since ...	21.3	22.7	11.4
4-1	Superphosphate of lime, 1859 and since	22.5	23.8	19.0
4-2	Superphosphate and ammonium salts, 1859 and since ...	34.3	36.7	27.1
11-2	Mixed mineral manures, ammonium salts and silicates, 1862 and since	62.5	78.9	84.8
17	Nitrate of soda alone ...	33.9	36.7	26.3
20	Nitrate of potash and superphosphate	36.5	49.0	45.5

Professor Perkins said he had chosen a few of the plots showing experiments in manuring grass lands. In respect to the second item, the return in 1902 was not much more than it was here. The result of using mixed mineral manures, ammonium salts, and silicates was exceedingly good. All the manures at Rothamsted were broadcasted.

TABLE VIII.

Rothamsted Experiments with Norfolk Four-course Rotation, 56 years (1848-1903). Typical examples from 48 plots variously manured and treated.

	Unmanured.	Mineral Manure.	Mineral and Nitrogenous Manure.
<i>Swedes—</i>			
Average 12 courses (1852-99), cwts. ...	13½	179½	287½
13th course, 1st crop (1896), cwts. ...	11½	240½	319½
14th course, 1st crop (1900), cwts. ...	15½	275½	499½
<i>Barley—</i>			
Average 12 courses (1852-99), bushels ...	23½	35½	43½
13th course, 2nd crop (1897), bushels ...	11½	37½	42½
14th course, 2nd crop (1901), bushels ...	21½	25	32½
<i>Clover or Beans—</i>			
Average 12 courses (Beans, 8 courses), bushels (1852-99) (Clover, 4 courses), cwts. ...	12½	18½	23½
13th course, 3rd crop (1898), Beans, bushels ...	23½	58½	67½
14th course, 3rd crop (1902), Clover, cwts. ...	0½	33½	22½
<i>Wheat—</i>			
Average 12 courses (1852-99), bushels ...	24½	6½	9½
13th course, 4th crop (1899), bushels ...	30	25½	36
		42½	41½

In the above the roots were fed on the plots. Manures when used were applied only at the head of the rotation course to the Swedes.

This was the Norfolk 4-course rotation. The experiments covered 56 years, or 18 courses. He had taken three examples. The plot was manured one year at the head of the rotation, and the manure was supposed to spread its effects over the four years. He wanted them to look upon the figures that had been shown as nothing more than simply an illustration of the lines upon which experimental work should be conducted. He hoped to be in a position in another year to map out some such work in the hope that it would be started at the Roseworthy Agricultural College. He proposed to set aside a field of 150 acres on which nothing else would be done but experimental work. They might get one result in one soil, and another in another. They could not carry out the work on the same scale as Sir J. B. Lawes, who was wealthy, and left money, so that the experiments could be continued after his death.

In reply to questions, Professor Perkins said he purposed having two-acre plots, and he thought that area would be sufficient. He had first proposed having plots of five acres, as adopted in the case of Lawes; but that would have meant much greater expense. He would be pleased to inspect any experimental works Branches of the Agricultural Bureau might start, and if he could be of any help to them he would gladly render that assistance. (Hear, hear.) His advice to them was: do not attempt too much. They should make up their minds to get a certain point, and keep to their task. If they tried too much, possibly the whole undertaking would fail.

Mr. McEwin (Brinkworth) asked if previous experiments in agriculture had been carried out in the North?

Professor Perkins said there had been experiments in a sense, but they had not been kept up continuously.

In reply to further questions, Professor Perkins said there was not now any unmanured land at the Roseworthy College, and that made it difficult to make reliable experiments. The experiments that had been carried out there were the same as any farmer could conduct on a large farm. Supposing there was a large farm, and a portion of it had been treated with 2 cwt. of manure, and another part with 1 cwt., how then could an experiment on such a place compare in a reliable manner with another? In any rotation of crops they must bear in mind that everything leads to wheat.

A delegate said what he understood Professor Perkins to advise them to do was to try small experiments with commercial fertilisers in their own districts, that they should inform the Professor of the results, and that the experiments carried out at Rothamsted were no guide for South Australia, except that they were good lines to follow. (Hear, hear.)

Professor Perkins, in reply to a question, said it was the practice amongst uncivilised Arabs to scatter seed wheat and manure on the surface of the soil, and plough them in.

A delegate stated that some South Australian farmers did so on light soil. Another declared that the method was adopted in rough mallee country, where the drill could not work, and the after result was just about the same as when the seed was drilled in.

Mr. McEwin (Brinkworth) said the putting in of wheat that way was sometimes done with the idea that it was not so liable to go down. One season he had tried both that and the ordinary method; but found that the seed scattered on the surface and ploughed in did not stand up so well as the other.

Mr. Malcolm (Kadina) said it was stated at the last Congress that attempts would be made to cultivate the salt patches, and he would like to know if anything had been done in the matter.

Mr. W. L. Summers said the Agricultural Department had started experimental work on exceedingly salty land at Yorketown. The land, consisting of a good many thousand acres, at one time grew very good crops. Then it became affected with the salt, and crops could not be grown on it. The experiment of growing mangolds, kale, and saltbushes was tried. Many of the seeds failed to germinate, but those that did grew well. One plot last year had grown wheat and barley. The latest report that had been received stated that the wheat was doing very well; but the barley had suffered through too much cold weather being experienced. The Department hoped to be able to take off a root crop. If the Government could get suitable localities, and men who were willing to go to trouble over these experiments—

the difficulty now being the expense—they would establish two more such experimental plots in different districts. He expected that within three months' time they would have the results of experiments with saltbush, wheat, and barley.

A delegate said he had tried to grow almost everything on the salt swamps on the River Murray; but was unsuccessful in trying to get them to grow.

Mr. Miller said what they wanted information about was the best crops to grow on salt patches. He thought that mangolds and rape were good crops to stop drifting sand. He had at one time a salt patch on his farm. Then sand drifted over the spot, and he planted rape on the sand. The rape prevented the sand from drifting further, and reclaimed the salt patch, which had since grown an excellent cereal crop.

A delegate suggested that couch grass should be tried; but Mr. Summers stated that while this grass would grow on the beach right up to the sea, it would not grow on salt lands, the inference being that there was not so much salt in the sand at the seaside.

Mr. A. L. McEwin (Brinkworth) said he wished to draw attention to Professor Perkins' remark to the effect that later on our producers had better clear if they did not get better returns than they were securing at present. He did not know whether the Professor was joking or not.

Professor Perkins said what he meant to say was this: that there was a lot of land in South Australia that was capable of giving better returns than they did at present. Doubtless within 50 years' time our population would have doubled, or even trebled, and no doubt we would have to take more from the land than we did at present. If we did not do so, some of the population would starve. At present, in our best counties, the average yield was not more than 10 bushels to the acre.

Mr. McEwin (Brinkworth) declared that in some of our districts the wheat yield had more than doubled, possibly trebled, within the past few years.

Professor Perkins—You cannot say that; the official statistics are against you. The poor land will have to grow more; if we cannot make it, then we will have to give place to somebody else.

Mr. H. Kelly said he would like to remind them that some people did not exert themselves to get all they could off the land. He saw an amusing picture the other day. It represented a stable almost buried in manure, and the owner having been heard to say: "What had I better do; remove the manure or the stable?" (Laughter.)

Mr. Malcolm (Kadina) thought that our children, with their advantage of later-day agricultural education, should be expected to get more off the land than their parents were getting. As a matter of fact, greater returns would have to be got.

TESTING FOR ROCK PHOSPHATE.

By W. S. CHAPMAN, School of Mines Analyst.

The Editor has requested me to indicate a method by which a careful man of ordinary intelligence would be able to make a rough test for phosphoric acid of supposed phosphatic rocks. The simplest method I am acquainted with is by the use of a solution of ammonium molybdate and nitric acid, which should be prepared as required, and should not be kept for more than a few days. This solution is made as under:—To one part by volume of crushed ammonium molybdate add ten parts of rain water; allow this to stand until all, or nearly all, of the ammonium molybdate has dissolved. Measure into a glass beaker an equal volume of strong nitric acid, into which the previous solution should be poured. The nitric acid must on no account be poured into the molybdate solution. Crush the sample to be tested to a fine powder and intermix it thoroughly. Then weigh out 10 grains of the sample. If no proper scales are available pour the powdered phosphate on to a threepenny piece placed on a table, and lift the coin carefully; it will carry approximately ten grains of the powder. Place the powder in a glass test tube, add about five times its bulk of strong nitric acid, and boil for a few minutes, then add an equal

bulk of water, and shake. If any considerable proportion of the sample remains undissolved, the solution must be filtered. To the filtered solution add about 1 oz. of the molybdate solution, shake gently, and warm it to about blood heat; boiling must be avoided. Should the sample contain phosphoric acid a yellow precipitate will form. If the percentage of phosphoric acid is very low the precipitate may take some minutes to form, but with a fairly good sample the yellow precipitate appears almost at once. A *white* precipitate is *not* an indication of phosphoric acid. The higher the percentage of phosphoric acid the greater the amount of precipitate.

If this rock test shows a large amount of precipitate, some idea of the value of the rock may be gained by comparing it with a material containing a known percentage of phosphoric acid. Take two grains only of the original powdered sample, and treat it as before. Take two grains of ordinary mineral super containing about 40 per cent. of phosphate and treat this in another glass test tube in the same way, and compare the amount of precipitate in the two samples.

Should this second test indicate that the sample contains an appreciable amount of phosphoric acid, an average sample, or, if the rock varies much in appearance, two or three samples, of about $\frac{1}{2}$ lb. each, should be forwarded to the School of Mines for analysis. The usual fee is 10s. 6d., but samples submitted by members of the Agricultural Bureau, through the Department of Agriculture, are tested for 3s. each. If samples are obtained from Crown lands and the exact locality stated, no charge is made for analysis.

To carry out these tests the following will be required:—An 8-oz. glass beaker, three or four glass test tubes, a small glass funnel for filtering, some filter paper, and two or three ounces each of nitric acid and ammonium molybdate. A small spirit lamp for heating the solutions in the test tubes will be found most convenient. The whole outfit will not cost more than 5s., including the spirit lamp. A convenient holder for the test tubes may be made by twisting a stout piece of paper around the top of the tube, so that the two ends may be grasped between the thumb and first finger. This will avoid risk of burning the fingers. Always keep the tube moving gently over the flames or the glass may break.

ST. JOHN'S WORT (HYPERICUM PERFORATUM).

By W. L. SUMMERS.

In the January, 1904, issue of *The Journal of Agriculture* we published a coloured plate and description of this weed. Owing to its objectionable nature it was determined to carry out some tests with a view to killing the plants. Owing to the rocky nature of much of the land occupied by it, cultivation, which is an effective agent in its destruction, cannot be utilised. On January 30 I marked out nine small plots of land at Coromandel Valley thickly infested with the weed, and treated them as follows:—

Plot 1.—Weeds cut and arsenite of soda (Kedzie's formula), at rate of 1 pint to 10 gallons of water, applied to the plants.

Plot 2.—Same treatment as No. 1, but weeds left uncut.

Plot 3.—Same as No. 1, but double strength solution used.

Plot 4.—Arsenite of soda, 1 pint to $3\frac{1}{2}$ gallons, applied after cutting the plants.

Plot 5.—Same as No. 2, but double strength solution used.

Plot 6.—Sillex weed destroyer applied, at strength of 1 to $7\frac{1}{2}$ of water, after cutting the weed.

Plot 7.—Sillex weed destroyer, 1 part to $7\frac{1}{2}$ parts water; weeds not cut.

Plot 8.—Sillex weed destroyer, 1 to 5; weeds cut.

Plot 9.—Same as No. 8, but weeds not cut.

A fortnight later the plants where the Sillex weed destroyer had been applied were all brown. Those where arsenic was used showed less effect. Early in March there was, however, little difference noticeable on the surface, and no conclusions could be arrived at until the plant made fresh growth in the winter.

In August I carefully inspected the plots, and found that where the arsenic had been applied there was a very strong and luxuriant growth of the *Hypericum*, even more so than on the untreated land. Where the *Silex* weed destroyer had been applied the vegetation was all brown and burnt, and the stems of the *Hypericum* beneath the surface were quite dead. A plant of sweet briar rose and a clump of fennel upon which the solution had been sprinkled were also killed right out. This *Silex* weed destroyer is manufactured by Mr. W. H. Brewer, of Melbourne, and, like a good many other patent mixtures, its cost renders its use prohibitive. In five-gallon drums it costs 3s. per gallon in Melbourne, and, as it would take at least 50 gallons of solution to dress an acre of land effectively, even at the strength of 1 to 7½ of water, it would cost at least £1 per acre for materials alone for one dressing. If freight and charges are added, the cost would probably come to £1 5s. to £1 10s. per acre.

The failure of the arsenite of soda was very disappointing. Possibly the application of a stronger solution in the spring would have had a better effect. The result should, however, remove the apprehensions of those orchardists who fear that the application of arsenical sprays year after year to the fruit trees will in the end have an injurious effect on the land. The strongest solution applied in this instance was twelve times as strong as that used in spraying fruit trees, and no lime was used to neutralise its injurious effects. Besides, the ground was thoroughly wetted with the solution, without, as the result showed, injuring the roots close to the surface.

INFLUENZA AND STRANGLES IN HORSES.

By Veterinary Surgeon DESMOND, Government Veterinarian.

INFLUENZA.

Influenza—commonly called pink eye, owing to the pink colour of the inside of the eyelids and the red appearance of the gums and tongue and the inside of the lips—is an infectious fever, which shows a marked tendency to rapidly spread over large areas of country, often attacking 50 per cent. or more of the horses in the infected area. It may appear suddenly without preliminary symptoms, and become developed in twenty-four hours. The usual symptoms are those of a cold, but these may be complicated with chest, bowel, joint, and brain troubles. It always gives rise to great debility. When treated in a rational manner, it usually runs its course in about ten days, and the affected animal is well in three weeks. One attack generally protects the animal for a period of from one to five years against further infection. Horses in all conditions are susceptible to the disease. The death rate among properly treated cases should not exceed 1 per cent. The complications, which, as a rule, arise from bad treatment, should be attended to by a veterinarian.

Treatment.—The first essential is good nursing. If this is done in a rational manner, in the majority of cases no medicines will be required. Place the affected animals in a large, roomy loosebox, free from draught, and give a bed of clean straw. Soft food, such as scalded oats and oaten chaff, are to be offered, but wheat and wheaten chaff are not to be given. Clean cold water, with an ounce of nitre or a handful of Epsom salts to the bucketful, must be kept in the manger. If the horse has a sore throat apply extract of belladonna and glycerine, covering with a warm bandage, and smear extract of belladonna and treacle, in the proportion of 1 drachm of the former to ½ oz. of the latter, on the back teeth, with a flat tablespoon three or four times a day. Provided proper care is exercised it will be an advantage to steam the head with hot bran and eucalyptus twice a day. On no account should the owner, unless under veterinary advice, give medicine by the mouth, *i.e.*, a drenching.

STRANGLES.

Strangles (pyogenic fever) is a disease peculiar to the horse family, and is known in all parts of the world except Iceland. This disease, which is allied to measles in the human subject and distemper in the dog, as a rule affects young horses. During favourable seasons the attack may be so slight that the animals are not noticed to be ill by the owners. As a rule, one attack

protects the horse from subsequent attacks, even when placed in touch with affected animals, and using the same buckets and mangers. When aged horses, over ten years old, are seized with this disease, the trouble is serious, and convalescence is very slow. Symptoms.—The horse is dull, will not take ordinary feed, and is feverish. At first, a little discharge runs from the nose. About the third day this discharge is sticky, while later it has a greenish-yellow colour. A swelling appears under the lower jaw, which, as a rule, becomes hard and painful, and later may form an abscess and break. There is difficulty in breathing, and swallowing is painful, and in drinking water a portion escapes through the nose.

Treatment.—If the horses are affected in a mild form, while running at grass, provided there is good grass and shelter, it is as well to leave them alone. If the paddocks are bare and afford no shelter, put them in large, warm sheds, feeding liberally on soft food. In the more severe cases, if the swelling under the jaw becomes very hard, apply a fly blister, and lance it when it becomes soft, *i.e.*, comes to a head. When the breathing is distressed steam the head several times a day, as advised in treating influenza. On account of the enlarged conditions of the gland of the throat, medicines should not be poured down the mouth or nose, as there is a great danger of fluids escaping into the windpipe and causing suffocation. The animals should be carefully nursed, to keep up their strength, to cast off the disease, and prevent complications. If the bowels are constipated, give linseed tea to drink, and administer rectal injections of hot water, oil, and soap.

In treating cases of influenza and strangles, bleeding and purging are to be avoided.

POULTRY NOTES.

Written for *The Journal of Agriculture*.

By D. F. LAURIE.

SEPARATION OF THE SEXES.—As soon as the cockerels approach the time at which their sex asserts itself they should be drafted into separate runs. The age at which this is necessary depends a good deal upon the breed. Andalusians, Leghorns, and Minorcas are generally very precocious, and cockerels at the age of six or seven weeks begin crowing, and soon after worrying the pullets. This is bad for both cockerels and pullets, and the sooner they are separated the better. The cockerels of some breeds become very quarrelsome if allowed to continue with the pullets. Experience has taught that both sexes grow faster and better when separated. It may be argued by some that hitherto they got good results without this extra trouble. Were this really the case there would be no need for any advice on the subject, but so far we know that this and other careless practices have resulted in the past in many losses and disappointments. Careful and successful breeders in other parts of the world, as well as Australia, have proved that the modern methods, so often advocated in the poultry press, are absolutely essential to success.

GRADING CHICKS.—The careful grading or sorting of chickens into sizes and ages, having due regard to both points, is a feature in many well-conducted poultry yards. Birds of mixed ages and sizes do not do well together; the strong get all the food and bully the weaker, who fail to thrive. It is, of course, a matter of some labour and expense to have various yards or colony houses, but to achieve success proper equipment and conveniences are essential. The younger and weaker birds require more frequent and special feeding, which they cannot well obtain unless separated from the others. As a makeshift, for operations on a small scale, the smaller birds may be fed inside a ring of wire-netting, of which the mesh is large enough to admit the small birds within the enclosure, to the exclusion of the older and stronger birds.

SHADE AND SHELTER.—As the sun is daily increasing in strength, young stock especially require more shelter than is usually provided. Those who have not planted shelter trees and shrubs must provide shelter in some other form. Calico, sacking, etc., may be stretched on strong, but light, frames, and will provide fair shelter; but the material soon rots, or tears with the wind, and is

a source of expense. Boughs of trees, or even thatch, may be used to cover low structures, under which the birds can congregate during the heat of the day. I have seen many of these shelters in Victoria, where they give satisfaction. It is too late to plant this season; but the fact that natural shade is the best should be borne in mind early next year.

STORING EGGS.—Eggs have been very cheap this year, for reasons which it is not necessary here to discuss. It may, however, be pointed out that the sooner we open a trade with England the sooner can regularity in local prices be looked for. The average householder is chary of buying many eggs when the price reaches 1s. 6d. per doz. and over. Fresh eggs procured now may be preserved by one of several methods, for use some months hence. Water-glass has given universal satisfaction, and is the most convenient for use on a large or a small scale. The required quantity can be ordered through any storekeeper, with directions from the vendor. Canadian experience proves that a weaker solution than that usually advised assures success. The usual quantity is a 10 per cent. solution; but in Canada 5 per cent. has given splendid results. In Sydney cold storage is largely availed of for keeping eggs. Other methods consist of packing the fresh eggs in lime water, dry salt, wood ashes, or powdered charcoal. It is essential that the eggs are quite fresh—the fresher the better—and to obtain the best results they should be infertile. As soon as the breeding season is over the male birds should be removed from the breeding pens.

CULLING.—This term applies to pure-bred poultry more than to ordinary birds. No good can result in continuing feeding chickens which are manifestly inferior and defective. As soon as old enough these should be disposed of, either by sale or used as articles of food. More space is then left for the more valuable birds. As a rule, breeders hatch more chickens than they require, so that the weeding-out process will leave them a fair stock. Over-crowding is one of the worst and most common mistakes. All birds do better in small flocks, and the more space they have the better. Acres for a few birds are not necessary, but at the least each must have a proper amount of space. Otherwise the ground soon becomes stale, and considerable labour is necessary in turning over the ground or cropping portions of it to sweeten it.

DISEASES.—With the approach of warm weather certain diseases make their unwelcome appearance. To guard against such inroads very great care must be taken with the drinking water and utensils generally. The soil must never be allowed to become saturated with filth. Such spots are invariably the breeding grounds of various organisms. At the first sign of disease or ill-health the bird should be isolated and carefully watched. Always have a few small pens for use as hospital or inspection pens. A reference to my poultry manual will give particulars of symptoms and remedy. Careful examination is necessary, as several diseases are somewhat similar in general appearance, though quite distinct in important points. Use carbolic acid and other coal tar disinfectants freely. Air-slaked lime is also one of the very best things to use about the runs and houses. Quicklime may be eaten by the birds and cause death. Scald, with absolutely boiling water, by dipping for preference, all drinking and food vessels at frequent intervals. These are often sources of contagion or infection. Half a minute in boiling water will destroy most of these dangerous organisms, and the labour and trouble involved is slight in comparison with the resulting saving of poultry life.

“JOURNAL OF AGRICULTURE.”

From January 1, 1904, the “Journal of Agriculture” will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a **REGISTRATION FEE** of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s 6d. per doz. The indexes of Vols. I. to VII. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

FURTHER NOTES ON TASMANIAN FRUIT-GROWING.

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

FRUIT CASES.

The sawmilling business in Southern Tasmania must derive considerable benefit from the continued extension of the fruit-growing industry. There is probably no other subject more generally commented on by visitors from the mainland than the great variety of uses to which the native hardwood timbers are put. In the country districts the majority of the houses, sheds, stables, etc., are built of sawn timber. This is done even on land where stones are so plentiful and difficult to dispose of that they have to be built into dry dykes along the boundaries and across the orchards or fields which surround such buildings. Everything in the direction of boxes for fresh, dried, or preserved fruits appears to be made out of the local wood. In the fruit season stacks of casewood timber, bound up into shooks, made-up empties, or filled cases, appear to be the burden of every dray, railway truck, or river boat one passes in town, suburb, or country. The long, narrow, or flat splitwood case has been almost entirely superseded by the neat box known as the Peacock or "dump" case, made from sawn timber. Huge stacks of these may be seen piled upon the wharves and in the adjoining sheds, built with a solidity and evenness rivalling the work of a skilled bricklayer. These cases have not such a bright appearance as our white pinewood boxes; but they are supplied by the mills to the growers at a very cheap rate compared with the prices paid by our apple shippers for imported or locally-grown pinewood cases. I heard of quotations as low as 4½d. each; and away up the Derwent Valley, at Glenora, the cases could be delivered in the orchards at 6d. each. Our pinewood cases range from 10d. to 1s. each, according to the distance from the capital, so that the Tasmanian grower starts with a saving of from 5d. to 6d. on the cost of marketing his case of apples for export. There appears to be a considerable prejudice in South Australia against the hardwood case for the transporting of fruit. It discolours much more rapidly (more particularly if sawn up while the timber is green), is heavy to handle, and is unyielding to pressure. While this latter characteristic has its drawbacks, it also has advantages over the ofttimes too flimsy pinewood cases used by us. When carefully packed and properly protected by wood-wool, the contents of the hardwood case should be as safe from bruising if not more secure than those fruits in softer and more elastic cases of pine. There can be no doubt that the Tasmanian apples are bruised more than those packed here; but after seeing the whole process of picking, packing, and shipping in operation I am of the opinion that the hardwood case is not to blame; but rather the softness of the fruits and the tightness and haste with which they are put into the cases. More care in toughening the skin, and in placing and padding the fruits into the cases would, I believe, result in a return more than sufficient to cover the extra cost.

Now that the supply of Australian apples for European markets has exceeded the stage when fancy prices were given for a fancifully put-up article, we must face the hard fact that only the actual value of the commodity will sell it in the future. I am disposed to think that a case with a dull exterior, providing it is not absolutely unsightly, will bring as much—assuming its contents are in uniformly good condition—as any other.

The Tasmanian hardwood for these cases has been offered in shooks, in the ship's slings at Port Adelaide, for 5½d. each, which would mean about 7d. made up ready for filling; but I am informed no business has resulted. As the cargo is not gauged by weight, the heavier case does not increase the freight in the cool chambers on the steamers, though it may in road and rail carriage.

Starting with a handicap of from 5d. to 6d. less expended in preparing his box of fruit for shipment, the Tasmanian apple-grower has an advantage which represents a fair trade profit in itself. This is one point wherein it is possible for our exporters to reduce expenditure. Although we have not such large supplies of stringybark timber upon which to work, there is much timber in our ranges which could be utilised for this purpose. It has also been demonstrated by our State Forest Department that in 20 years, under conditions not too favourable, pinewood from the Remarkable pine (*Pinus insignis*), very suitable for casemaking, can be grown at a profit on waste lands. There are considerable areas of waste hillside land within those districts where

a heavy rainfall occurs, and right in amongst the apple-growing centres also, which might well be occupied by these trees rather than by the useless brush or scrub timber trees.

Although the fact may be well known, I noticed the Tasmanian people laid considerable emphasis on cutting the timber for casemaking, more particularly for "ends," in the manner indicated in the accompanying sketches. The

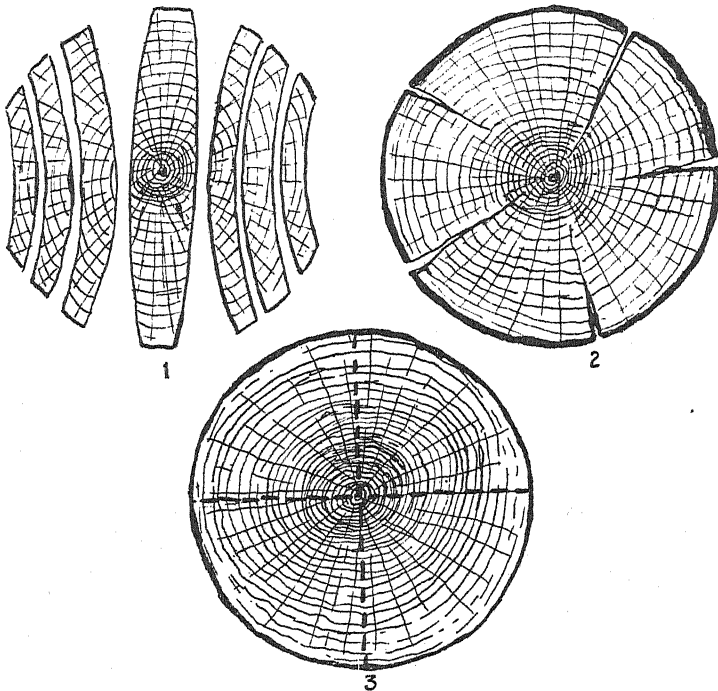


Fig. 1.—Represents the shrinkage and warping of boards when cut so that each margin is composed of sapwood.

Fig. 2.—Shows the splitting due to natural shrinkage of the sapwood.

Fig. 3.—Method of quartering a log prior to sawing into boards.

shrinkage which causes the warping and splitting so troublesome with unseasoned timber is largely avoided by this simple plan of quartering the log before sawing it into boards.

PESTS AND DISEASES.

With the exception of the apple mussel scale (*Mytilaspis pomorum*) the pests observable in the orchards of Southern Tasmania do not appear to the casual visitor as being very destructive. In the north the pear and cherry slug (*Selandria cerasi*?) reduces the hawthorn hedges to a rusty, leafless condition; but the ravages of this pest were not so noticeable in the South, though doubtless it is present.

The codlin moth is present in the orchards; but close attention keeps it within bounds in the commercial plantations. I do not think this pest is as prolific in the island State as in our warmer climate. In Tasmania one had to

search carefully amongst the drooping, fruit-laden branches to discover any evidence of its presence at all; and an unsuspecting visitor would see no outward signs to arouse suspicion. I am bound to admit that more codlin infected apples could be seen in walking through one small, unsprayed orchard in South Australia than came under my notice during many days spent in visiting orchards where the production of apples would amount to many scores of thousands of bushels. As far as the life history of the insect is concerned, the majority of those who have paid any attention to the subject favour the single-brood theory; but a long-drawn-out period of incubation apparently spreads the emerging moths over the greater portion of the time occupied by the development of the fruits. Many growers assured me that those caterpillars which entered the bandages in the early summer did not transform into moths again during that season. If this be so, the evidence is very strongly in favour of the single-brood theory.

A law exists, the essential principles of which throw the onus of compulsory attention to the pest on locally elected Boards, chosen by and from the fruit-growers. The payment for such work is made by imposing a rate upon those interested, just in proportion to the areas they have under fruit. This law appears to be enforced more or less rigidly, just in accordance with the *personnel* of the Board for the time being holding office. The Central Government has power to keep these Boards up to the requirements of the law, and the public officer in charge of this branch, who does not hesitate to put the law into motion, occasionally stirs up considerable discussion, and "gets himself well hated" in certain quarters for his conscientious zeal.

The methods hitherto adopted for suppressing the pest have consisted of bandaging the tree stems and plucking regularly the infected fruits, as they could be detected on the boughs. It is only during the last year or two that spraying with arsenical compounds has been fairly tested, and while *paris green* seems to be the most in vogue, many growers eagerly enquired respecting the value of Kedzie's formula for arsenite of soda, as used here in South Australia. The whitewashed foliage and fruit so commonly seen in our arsenically treated orchards did not disfigure the apple trees there. Pointing to one of the largest trees in an orchard, I told the owner, in reply to his question, that our apple-growers whose orchards were composed of trees as large as that one sprayed them throughout as many as five and six times. This statement drew forth a look of blank amazement, in which doubt was clearly discernible.

By far the most serious insect trouble appears to be the mussel scale, to which reference has been made. This pest is widely distributed, and finds most congenial surroundings in the Tasmanian climate. Although present in some South Australian orchards in the cooler districts, it does not infest the apple fruits or trees anything like as freely as in the island State. This insect is a pest in all the colder fruit-growing regions of the world. The reason why it does not become sufficiently numerous to prove a serious trouble with us has never been investigated; but when this is done it will probably be found in the fact that our hot summer follows so suddenly upon the winter that the breeding season is restricted, and few of the insects are in the crawling stage after the fruits are formed, or the growth of the twigs has begun for the year. Various remedies are used; but the oil washes, such as kerosine emulsion, or red oil emulsion, find most favour. The kerosine emulsion is made upon the well-known Hubbard-Riley formula. The red oil emulsion, according to the Government Entomologist, is made by boiling 1 lb. of soap in one gallon of water. To this, while still boiling hot, one gallon of red oil is added, and emulsified by agitation, after which 14 gallons of clean water are added, to reduce it to the proper strength for spraying. This formula is used while the vegetative functions of the trees are dormant, and not otherwise. There is quite a "rage" over this remedy, and traces of coming trouble over its indiscriminate use, or probably incomplete emulsification before using, were observable.

Some of the river steamers are fitted with insulated holds, so that the packed cases of fruits may be fumigated with the hydrocyanic acid gas process en route down stream to Hobart. The efficacy of this mode of applying the treatment is open to question, and our experience here in attempting to disinfect scale-infested fruits in closely packed cases is decidedly against the effective eradication of insect life under such conditions.

The San Jose scale is said to have been found in Tasmanian orchards, but, as authorities with superior knowledge to mine have failed to agree that the

insect was the true *Aspidiotus perniciosus* of Comstock, I refrain from any comment. It might be mentioned, however, that if the outward characters agree with the true San Jose scale, its powers to wreak injury have diminished under these southern skies to a degree that is most eminently satisfactory to all concerned.

The American woolly aphid (*Schizoneura lanigera*) appears to enjoy unmolested quarters in pretty well all of the orchards excepting in a few of those planted more recently with trees worked on blight-proof stocks. In consequence of this many of the trees have club-like "boles" at the ground line, which remind one strongly of those callosities so peculiarly abundant upon our stunted mallee gums when growing upon shallow soils overlying limestone crusts. Many of these trees would receive short shrift to the wood pile if found in our orchards, but the restricted vigour consequent upon the presence of the distortions did not appeal so strongly to the orchardists in a climate where no growth is very rapid. The universal presence of this insect is doubtless due to the general use of the seedling apple stock upon which the trees are worked. This has its evils in the encouragement given to the woolly aphides, but what bearing it has upon the absence of "die back" in the trees and the much lower proportion of fruits attacked by "bitter or brown pitting" found in the apple orchards of Tasmania, compared with those seen in plantations of the same varieties on the mainland, where the stocks are all grown from blight-proof Northern Spy or Winter Majetin varieties, is a subject about which I hope to write further in the future.

Fungus diseases do not appear to do so much damage as on the mainland. In the wetter districts of this State and Victoria the quantities of apples and pears destroyed or reduced in value by the "black spot" (*Fusicladiums*) form an important item every year. In Tasmania this fungus does not figure very prominently, either on the trees or market supplies of the fruits. It is present, of course, and is treated more or less with the well-known Bordeaux mixture; but the cracked, blackened, and distorted fruits one is accustomed to here could be seen neither in the orchards nor even at the apple evaporating works. In conclusion, I must congratulate the orchardists of the island State on the clean condition of their plantations as far as diseases are concerned when compared with those upon this side of the strait. Whether such be due to the climatic conditions, the operations of the law, or the vigilance of the growers, it is not within my province to state, but it is somewhat significant that spraying appliances do not appear to form such an important part of the growers' equipment as they do here.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

Whereas September was dry and unfavourable, October has proved the reverse. Apart from a few days, the weather was fine, with showers at intervals, so that nearly two and a half inches has been recorded for the month. This has caused vines and trees to burst strongly, the growth on the vines being really good. Fortunately there has been no more frost, though the worst ever experienced at the College was on October 26, 1899. On that occasion the thermometer read eight degrees below zero.

Cultivation is being pushed on to work the land down to a fine, loose tilth. The rains have brought on large crops of wild melons, which need prompt attention in order to kill them.

Peach trees have been sprayed for black aphid where necessary, but owing to the dry conditions in September not much of this pest showed on them. Last year the pears showed traces of codlin moth, so this season spraying has been resorted to.

DEPARTMENTAL NOTES AND WORK.

In Executive Council on Wednesday, October 26, Mr. William Angus, B.Sc., was appointed Professor of Agriculture at the Roseworthy Agricultural College. Mr. Angus is the son of a farmer, and is thirty-two years of age. He studied agriculture and agricultural chemistry at South Kensington in 1895, and from 1897 to 1901 attended the Aberdeen University, graduating as B.Sc. In his educational course he occupied the following positions in the class lists:—First in agriculture and agricultural chemistry, botany, entomology, economics; third in geology (arts and science); and fourth in veterinary hygiene; and was bracketed first for the special prize as the best student of the department in 1900. His teaching experience has been considerable, and he comes to South Australia highly recommended. For six months he was engaged in delivering a course of lectures on agriculture in the West of Scotland Agricultural College, Glasgow, and was Assistant Professor and Demonstrator in Agriculture in the Yorkshire College, Leeds, for two years. He was also Principal of the Agricultural and Horticultural School at Holmes Chapel for one year, and his last position was Lecturer in Agriculture for the Essex County Council. When at the Yorkshire College he had full charge of various experiments carried on at Manor Farm, Garforth, and gave a course of lectures and demonstrations to the students and farmers. At Holmes Agricultural School he had the management of a farm of 100 acres, and while at Essex he delivered lectures to students and farmers at the technical laboratories at Chelmsford, and also gave a series of addresses on agriculture throughout the county.

During the past two months the Inspector of Fertilisers has visited Aldinga and Yorketown for the purpose of inspecting the departmental experimental plots. He has also attended a meeting of the Council of Agriculture at Roseworthy College and the Hills Conference of Branches at Woodside.

Besides attending to his routine work in connection with the Department and the Agricultural College at Roseworthy, Mr. Quinn has visited a number of orchards at Sandy Creek and attended the meetings of the Conference of Hills Branches of the Agricultural Bureau which was held at Woodside.

During September the Inspectors of Fruit passed 4,439 bushels of fruits, 2,777 packages of vegetables, and 97 parcels of plants for export to interstate markets where export certificates are demanded. About half of the fruits consisted of oranges, the remainder being made up of lemons, apples, and a few minor lines. The imports consisted of 8,313 bushels of fruits and 44 parcels of plants. Of the former bananas totalled 7,368 bushels and pine-apples 353 bushels. Twelve parcels of plants and 634 bushels of fruits were refused admission owing to not complying with the requirements of the law dealing with the introduction of plants and fruits.

In October 11,779 bushels of fruits and 95 packages of plants were submitted to examination by the Inspectors of Fruit before admission to this State. Of this number 1,050 bushels of fruit and 4 packages of plants were refused owing to not complying with the regulations made under the Vine, Fruit, and Vegetable Protection Act. During the same time the exports of fruits totalled 4,624 bushels, the parcels of plants 71, and the packages of vegetables 3,408. The imported fruits consisted chiefly of bananas, viz., 11,194 bushels, and the exported fruits of oranges and lemons, viz., 3,488 bushels. The large number of rejected fruits was made up almost entirely of bananas, which arrived overripe.

On Wednesday, October 26, members of Riverton and Stockport Branches of the Agricultural Bureau, together with friends, visited Roseworthy College. Altogether there were about forty visitors, and a careful inspection of the crops and stock was made. The visitors were much pleased with the appearance of the crops, and a satisfactory harvest, both in respect to grain

and hay, is anticipated. On October 27 the senior students, in company with Professor Perkins and Mr. George Jeffrey, visited the wool stores at Port Adelaide, by invitation of several of the leading brokers. A very interesting and instructive day was spent in examining the wool, which was prepared ready for the usual auction sales.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held at Roseworthy on Wednesday, October 12. The following members were present:—Col. Rowell, C.B. (Chairman), Messrs. J. Miller, A. Molineux, R. Marshall, A. M. Dawkins, R. Caldwell, G. F. Cleland, T. E. Yelland, G. R. Laffer, and W. L. Summers (Secretary).

Feeling reference was made to the loss sustained by the agricultural community by the death of Mr. Krichauff, and to the value of his services to the State. On the motion of Mr. Caldwell, it was decided that the Secretary forward a letter of condolence from the members of the Council to the widow and family of their late member.

On the motion of Mr. Miller, it was decided to send a letter of condolence to the family of the late Mr. J. McLachlan, a former member of the Agricultural College Council.

The Minister forwarded report by Professor Perkins on a resolution of the Council, asking that short courses in dairy instruction should be inaugurated at Roseworthy College. Professor Perkins stated that at present no facilities existed at the College for such courses, but when a suitable small model dairy was provided the question would be considered. He would point out, however, that as the district could hardly be looked upon as a good dairying district he could not recommend any considerable extension of the dairy herd.

Several of the members thought Professor Perkins was mistaken in saying the district was not suited for dairying. They were generally satisfied that where good crops of hay and wheat could be grown dairying could be carried on profitably, though, at the same time, they would not recommend any considerable extension of the College herd. Mr. Marshall stated that he had carried on dairying profitably for many years under similar conditions to those prevailing at Roseworthy. In regard to feed in the summer, he used to grow sorghum every year, having as much as 400 acres under crop some seasons, and he experienced only one partial failure with sorghum in four or five years. After an inspection of the dairy building, it was agreed that it was not suitable for the purpose, and that the appliances required for teaching special dairy courses were not available. On the motion of Mr. Cleland it was resolved that further consideration of the matter be postponed, and that the Minister be asked to allow the Dairy Instructor to attend next meeting of the Council and explain how the desire of the Council in the matter of dairy instruction could be given effect to.

The Secretary called attention to various resolutions carried at the Annual Congress.

It was decided that, on behalf of the Agricultural Bureau, the Council should accept the offer of representation on the committee fixing the annual f.a.q. standard for wheat, which was made at the Congress by the delegates from the Chamber of Commerce. Messrs. J. Miller and R. Marshall were appointed to represent the Bureau in this matter.

The resolution dealing with increase in the limit of membership of Branches was discussed at length. Mr. Molineux opposed the proposal, as he was convinced that it would lessen the standing of the Branches, and also have a disastrous effect on their work to make the membership unlimited, as proposed. Mr. Cleland could not see why an increase in membership should have the result feared by Mr. Molineux. His experience was that the more members the greater enthusiasm in the work. He moved:—"That the resolution of Congress be given effect to." Mr. Dawkins suggested that it should be made a condition that all nominations for membership should be made by resolution of the Branch, and supported by at least two-thirds of the members. They had such a rule in the Gawler River Branch, and it would prevent undesirable persons being nominated for membership, and would also make it impossible for a small meeting to nominate a large number of new members. The motion, with the addition suggested by Mr. Dawkins, was carried.

The Secretary stated, in regard to resolution asking that facilities be afforded to members of the Bureau to visit the College, that all the necessary facilities already existed. [See page 173, October issue of *The Journal of Agriculture*.—Ed.]

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. J. J. Schmidt, Denial Bay; W. Odgers, Gladstone; O. Sharp, Forest Range; P. J. Murphy, Mallala; J. Bourke, Amyton; F. F. Smith, Mount Remarkable; J. Honor, Maitland; W. A. Terry, Boothby; E. A. Stafford, Renmark; A. E. Smith, Inkermann; J. E. Gameau, Reeves Plains; T. Story, Elbow Hill; C. Drayson, Dawson; J. Badman, Riverton; A. Thomley, J. H. Hoad, and F. S. Hiscock, Meningie; and C. Warner, Dawson.

In reply to enquiry, the Secretary stated that no report had been received in reference to cattle complaint. It was decided to ask the Minister to obtain all the papers in connection with this matter, and to return them to the Council.

The members were driven around the farm by Professor Perkins,* and made a careful examination of the crops. Satisfaction was expressed at the freedom from weeds, and also at the way the crops had withstood the dry weather.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on November 1, 1904:—

The dry conditions referred to in our former continued well into October, by which time it looked as though the wheat crops would be a partial failure, but a most opportune break-up in the weather occurred on the nineteenth, when one of the finest general rains for months was recorded throughout the agricultural areas. Since then genial climatic conditions have prevailed, so that the wheat plant has put up an excellent recovery, and it is now quite expected that after all an average yield will be secured. Even in parts where crops were feared to be a total failure, these will at any rate return seed and flour. Feed and water have seldom been in better supply, the squatting element generally being well satisfied with the very assuring position.

Commercially, fairly brisk trade in almost all lines has been experienced, no doubt directly attributable to the much improved prospects, also the fact that at Broken Hill the Mines are giving satisfactory returns, whilst the outlook is also more promising than for years. In Metals, Silver, Copper, and Lead show a firming.

BREADSTUFFS.—The high price for wheat in Europe mentioned previously brought forward such large quantities that buyers withdrew from the market, and values fell considerably. Even the war scare of a week since had little effect on prices; 32/9 is the last sale reported for cargo to arrive, and 33/3 to 33/6 is about the value for present shipment, whilst possibly 34/ for very small cargo, January-February loading, might be obtained, but there is no life in the market. In Victoria and New South Wales parcels have changed hands at about 3/6, and here a fair amount of business has been done at 3/6 to 3/7. Farmers have sold stored wheat very freely, the improved harvest prospects no doubt leading them to realise. The first lot of new season's wheat has been brought to market, but it is reported to have been prematurely ripened, and although the sample weighs 62 lb. to the bushel it is not considered of fair average quality. **Flour.**—Shipments to London and Liverpool are still going on, and one vessel at Port Adelaide is loading a full and complete cargo of, say, 2,700 tons, otherwise there has been but light demand. Bakers have been filled with contract flour, the other States requiring very little. **Fodder.**—Since the rains farmers have been much more eager to dispose of their hay, but on the other hand exporters of chaff would only operate on real prime stuff, with the result that parcels sold for shipment have been somewhat limited, whilst the call locally for chaff has been anything but brisk. **Offal** has remained firm, and good business done in both Bran and Pollard. **Feeding Grains.**—Quotations remain about the same, the market occasionally being relieved by a few parcels that have been sold to fill Western Australian orders.

POTATOES.—It is seldom that the keeping qualities allow "Gambier" grown to supply the Adelaide market so late in the year, but the unusually cool temperatures experienced enabled growers to forward the tuber in ex-

cellent condition, so that stocks have been reduced almost to nil, and now there are only some odd parcels of old season's left on hand. Meanwhile, the few warmer days that set in towards the end of the month brought along increasing quantities of new "locals," and these are just about filling requirements. Onions.—The high rates asked for the few "Gambiers" offering attracted several parcels from Victoria, but in the meantime the new "locals" had made rapid progress, and are nearly supplying all wants.

DAIRY PRODUCE.—Supplies marketed during October have been heavier than for years, especially in Butter, as evidenced by the increasing parcels available each week for shipment to Britain, which, indeed, compare favourably with some of the best seasons'. This is apart from the fact that Broken Hill is now relying upon South Australia for her butter requirements. Western Australia also operates here for bulk to a very fair extent. Unfortunately, rates have had to give way somewhat under the influence of the lowering in the London market. For fresh, in prints, there has been no diminution in the quantities, and as factories have wisely only marketed sufficient for local demands, values in top grades sustained. In store and collectors' lines there is a slight fluctuation. However, at present rates, packers are again busily operating. Eggs.—It is seldom that prices have such an even run as during the past month, and although a substantial easing was reported in the east, the heavy local and shipping orders kept stocks from overlapping. Cheese.—With very few parcels of prime matured now obtainable, the trade have been forced on to the new season's make: result, sales are easily effected. Bacon.—Curers were expecting the seasonable demand to have set in, and were hopeful that heavier western business would have been put through, but the month closed with values weaker for factory sides. Hams.—An advance has been secured, strong enquiry for assorted weights. Honey.—Scarcely quotable until the new season's take comes on the market. Almonds met with improving sales.

CARCASE MEAT.—The trade at this time is not so readily disposed to purchase Pork or Veal, especially as most of the consignments were affected by the weather during transit.

In Live Poultry there has undoubtedly been a decided improvement in the quality of the birds penned. This is all the more satisfactory, as, although the numbers at times were fairly large, competition was unusually active, and good rates were obtained.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/6 to 3/7 per bushel of 60 lb.

FLOUR.—City brands, £8/15/- to £9/-; country, £7/10/- to £8/-.

BRAN.—8½d. to 9d.; POLLARD, 9d. per bushel of 20 lb.

OATS.—Local Algerian and dun, 1/5½ to 1/6½; white Champions, 1/9½ to 1/10½ per bushel of 40 lb.

BARLEY.—Cape, 1/8 to 1/9 per bushel of 50 lb.

CHAFF.—£2/12/6, nominal, per ton of 2,240 lb., f.o.b. Port Adelaide.

POTATOES.—New "locals," 7/- to 8/- per cwt.

ONIONS.—New "locals," about 5/- per cwt.

BUTTER.—Factory and creamery fresh, in prints, 8d. to 9½d.; best separators and choice dairies, 7d. to 7½d.; fair dairies and ordinary separators, 6½d. to 6¾d.; store and collectors' lines, 5½d. to 6d.

CHEESE.—Matured samples, 6d. to 7d.; new make, 5d. to 6d.

BACON.—Factory-cured sides, 5¾d. to 6¾d.; farm flitches, 5½d. to 6d. per lb.

HAMS.—S.A. factory, 8½d. to 9½d. per lb.

EGGS.—Loose, 6½d. per dozen.

LARD.—In bladders, 4¾d.; tins, 4½d. per lb.

HONEY.—2½d. for prime clear extracted, in 60-lb. tins; discoloured and candied, 1½d.; beeswax, 1/2 per lb.

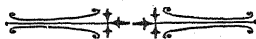
ALMONDS.—Softshells, 4½d.; kernels, 8¾d. per lb.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of October, 1904:—

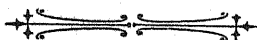
Adelaide ...	2.11	Manoora ...	1.66	Echunga ...	2.76
Hawker ...	1.50	Hoyleton ...	1.71	Macclesfield ...	2.51
Cradock ...	1.66	Balaklava ...	3.31	Meadows ...	2.34
Wilson ...	2.51	Port Wakefield ...	2.05	Strathalbyn ...	0.38
Gordon ...	1.79	Saddleworth ...	1.79	Callington ...	1.21
Quorn ...	3.05	Marrabel ...	1.93	Langhorne's Bridge ...	1.15
Port Augusta ...	3.22	Riverton ...	1.84	Milang ...	1.04
Port Germein ...	1.96	Tarlee ...	1.73	Wallaroo ...	1.55
Port Pirie ...	2.46	Stockport ...	2.03	Kadina ...	1.43
Crystal Brook ...	3.65	Hamley Bridge ...	1.10	Moonta ...	1.50
Port Broughton ...	2.19	Kapunda ...	2.01	Green's Plains ...	1.46
Bute ...	2.48	Freeling ...	1.84	Maitland ...	1.65
Hammond ...	1.92	Stockwell ...	1.69	Ardrossan ...	2.10
Bruce ...	1.94	Nuriootpa ...	1.78	Port Victoria ...	0.99
Wilmington ...	3.14	Angaston ...	2.02	Curramulka ...	1.70
Melrose ...	3.19	Tanunda ...	2.08	Minlaton ...	1.00
Booleroo Centre ...	2.60	Lyndoch ...	1.90	Stansbury ...	1.17
Wirrabara ...	2.27	Mallala ...	2.09	Warooka ...	0.84
Appila ...	1.98	Roseworthy ...	2.13	Yorketown ...	1.00
Laura ...	2.60	Gawler ...	2.05	Edithburg ...	0.93
Caltowie ...	1.82	Smithfield ...	1.96	Fowler's Bay ...	1.24
Jamestown ...	2.55	Two Wells ...	1.82	Streaky Bay ...	1.07
Gladstone ...	2.52	Virginia ...	1.95	Port Elliston ...	0.86
Georgetown ...	3.03	Salisbury ...	1.90	Port Lincoln ...	0.85
Narridy ...	2.61	Tea Tree Gully ...	2.95	Cowell ...	1.47
Redhill ...	1.85	Magill ...	2.53	Queenscliffe ...	1.08
Koolunga ...	2.44	Mitcham ...	2.13	Port Elliot ...	1.34
Carrieton ...	2.49	Crafrers ...	3.53	Goolwa ...	1.01
Eurelia ...	2.14	Clarendon ...	2.77	Meningie ...	1.31
Johnsburg ...	1.54	Morphett Vale ...	2.15	Kingston ...	1.97
Ororoo ...	1.89	Noarlunga ...	2.04	Robe ...	2.51
Black Rock ...	1.31	Willunga ...	1.84	Beachport ...	2.03
Petersburg ...	1.56	Aldinga ...	1.60	Coonalpyn ...	1.98
Yongala ...	1.77	Normanville ...	2.31	Bordertown ...	2.95
Terowie ...	2.33	Yankalilla ...	2.44	Frances ...	3.12
Yarcowie ...	1.54	Budunda ...	1.51	Naracoorte ...	3.02
Hallett ...	2.36	Truro ...	2.31	Lucindale ...	2.40
Mt. Bryan ...	1.71	Palmer ...	0.72	Penola ...	3.45
Burra ...	1.70	Mount Pleasant ...	1.62	Millicent ...	2.41
Snowtown ...	2.90	Blumberg ...	1.89	Mount Gambier ...	3.81
Brinkworth ...	2.64	Gumeracha ...	2.59	Wellington ...	1.48
Blyth ...	1.98	Lobethal ...	2.29	Murray Bridge ...	1.32
Clare ...	2.24	Woodside ...	2.40	Morgan ...	1.29
Mintaro Central ...	1.65	Hahndorf ...	2.42	Overland Corner ...	1.49
Watervale ...	2.21	Nairne ...	1.84	Renmark ...	1.96
Auburn ...	2.21	Mount Barker ...	2.32		



DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Nov. 23	Dec. 21	Mallala ..	Nov. 7	Dec. 5
Arthurlton ..	17	—	Mannum ..	19	17
Balaklava ..	12	Jan. 14	Meningie ..	12	10
Booleroo Centre ..	22	Dec. 20	Millicent ..	3	1
Bowhill ..	18	3	Minlaton ..	12	10
Brinkworth ..	4	2	Morchard ..	19	17
Burra ..	18	16	Mount Remarkable ..	17	22
Carrieton ..	22	20	Mundoora ..	18	23
Cherry Gardens ..	8	13	Nantawarra ..	23	21
Clare ..	18	23	Naracoorte ..	12	10
Clarendon ..	14	—	Norton's Summit ..	18	23
Colton ..	5	3	Onetree Hill ..	17	22
Crystal Brook ..	12	—	Orroroo ..	25	—
Elbow Hill ..	22	20	Penola ..	12	10
Endunda ..	21	19	Pine Forest ..	22	20
Finniss ..	7	5	Port Broughton ..	19	17
Forest Range ..	17	22	Port Elliot ..	19	17
Forster ..	5	3	Port Lincoln ..	19	17
Gawler River ..	18	23	Richman's Creek ..	21	26
Gladstone ..	—	Jan. 7	Riverton ..	19	17
Golden Grove ..	24	Dec. 22	Saddleworth ..	18	16
Hartley ..	—	23	Stansbury ..	—	3
Inkerman ..	22	20	Stockport ..	21	19
Johnsburg ..	19	17	Strathalbyn ..	21	—
Kanmantoo ..	18	23	Utera Plains ..	19	17
Kapunda ..	5	3	Virginia ..	21	19
Kingscote ..	14	12	Wandearah ..	21	19
Kingston ..	26	31	Watervale ..	21	19
Koolunga ..	17	22	Wepowie ..	22	—
Longwood ..	26	24	Whyte-Yarcowie ..	19	17
Lyndoch ..	17	22	Willunga ..	5	3
Lucindale ..	19	—	Wilmington ..	23	21
Maitland ..	5	3	Woolundunga ..	12	10



CONFERENCE OF HILLS BRANCHES.

The ninth Annual Conference of the Hills Branches of the Agricultural Bureau was held at Woodside on Friday, October 21, Mr. R. Caldwell (Chairman of the Woodside Branch) presiding. The following members of the Bureau were present:—Forest Range—Messrs. G. Monks, A. Green, J. Green, D. Townsend, H. Green, W. McLaren, T. Green, J. G. Rogers, R. Green, and J. Vickers. Cherry Gardens—Messrs. C. Lewis, G. Hicks, A. Broadbent, and H. Jacobs. Gumeracha—Dr. Stephens, Messrs. W. Bond and Lee. Strathalbyn—Messrs. M. Rankine and P. Cockburn. Longwood—Messrs. W. H. Hughes, T. G. Oinn, E. J. Oinn, E. A. Glyde, and J. Roebuck. Kanmantoo—Mr. John Downing, jun. Meadows—Messrs. W. Pearson, W. Stone, and G. T. Griggs. Hahndorf—Mr. H. Spoehr. Woodside—Messrs. R. Caldwell, T. Hutchens, R. N. Klemschmidt, C. W. Fowler, R. P. Keddie, W. Rolbusch, H. Rolbusch, H. James, W. Morcom, jun., W. Drogemuller, D. D. Murphy, and A. S. Hughes. Mount Pleasant—Messrs. F. Thompson and G. A. Vigar.

Messrs. G. R. Laffer and A. Molineux (members of the Council of Agriculture) and Messrs. J. Desmond, G. Quinn, and W. L. Summers (from the Department of Agriculture) also attended.

Chairman's Address.

Mr. Caldwell opened the proceedings by welcoming the visitors. He referred to the loss sustained in the death of Mr. Krichauff, who had promised to furnish a paper for the Conference.

On the motion of Mr. W. H. Hughes, it was decided to send a letter of condolence to the widow and family of Mr. Krichauff.

THE MOST ESSENTIAL FACTOR IN THE SUCCESS OF THE FARMER.

The Chairman read a paper on this subject. Many writers had dealt with this question, but to his mind they had almost invariably omitted the most important factor in the success of the farmer. He would not for a moment question the importance of good cultivation, careful management, the use of up-to-date, labour-saving implements, the judicious breeding of stock, etc., but above all he placed woman; not the woman who, to use a vulgar expression, "bosses the show," but the woman who is a true helpmeet to the farmer in the best sense of the word.

DISTRIBUTION OF FRUIT.

Mr. J. Sandercock, of Gumeracha Branch, forwarded a paper on this subject. He pointed out that the production of fruit in South Australia had reached such a stage that better facilities for distribution and new markets appeared essential to further progress. Although so far as apples were concerned the production was equal to only about three-fourths of a case per head of the population of the State, owing to lack of facilities for distribution they were compelled to look to overseas markets to dispose of their produce. With increased exports from the other States it was necessary for growers to consider how they could best extend the demand for their apples in Europe and elsewhere. They must also endeavour to reduce the cost of sending fruit to Europe. The necessarily high prices realised by their fruit in foreign markets placed them out of the reach of any but the wealthy; but at the same time he was satisfied they could, by combining, increase the demand, even at present prices. His idea was that they should appoint a good agent at the principal ports of entry in Europe to push their fruit in the right quarters, to sell as much as possible in advance, and to look to the distribution of the fruit on arrival. The Government might be asked to assist for a time, deducting all outlay from the returns received from the fruit, but he was satisfied that in the course of a few years the scheme would be self-supporting. Under such a scheme it would be an advantage to fix certain standards of quality for export, and to arrange for the inspection of the fruit prior to shipment. This would have the effect of improving the reputation of their fruit, and would in itself help to extend the market for it.

Mr. Laffer agreed with Mr. Sandercock that greater facilities for marketing their fruit were required, not only for overseas markets, but locally. It was not that production had overtaken the demand, but that the absence of local facilities prevented the growers from placing their fruit where it was

wanted. Particularly on their railways was improvement needed. They had to put up with the same primitive arrangements in regard to Broken Hill fruit and produce trade as existed twenty years ago. All this had to be sent in ordinary goods trucks, closely sheeted down, with the result that much of the fruit was greatly deteriorated, and consequently the price of good fruit was so high that the consumption was naturally limited. The South Australian Fruitgrowers' Association, which he regretted had not been supported by the growers as it should have been, had been working to improve not only the facilities for local distribution, but also in connection with the oversea trade. As a result they were promised much better arrangements by the interstate companies in connection with the trade to Western Australia, and he was pleased to say that, after receiving a deputation from the Fruitgrowers' Associations of the different States, the Prime Minister of the Commonwealth had promised to introduce legislation, placing upon the shipping companies reasonable responsibilities for the safe handling of fruit entrusted to their care. The South Australian Association had come to the conclusion that there was need for considerable improvement in the disposal of Australian apples, and intended to ask the growers to contribute towards the cost of sending a representative home to watch the fruit during the season and to report on results. Mr. Summers agreed with Mr. Sandercock that better facilities were needed in connection with the distribution of fruit. He was certain that if the cost between the grower and consumer could be reduced to a reasonable amount the local demand would be very much greater. So far as the oversea trade was concerned, he supported Mr. Laffer's remarks. Mr. Sandercock's scheme went too far and would prove too costly. They must not attempt too much. If the growers tried to deal direct with the retailers as suggested, the larger fruit brokers would boycott their fruit, and, as they would be able to purchase from the other States, the result would be disastrous to South Australia. Much good could, however, be accomplished by sending some one to England to watch their interests. Mr. Molineux and Dr. Stephens urged the necessity for paying more attention to the development of the local market and to the utilisation of the second grade fruit for drying and preserving, instead of placing it upon the market, to the detriment of the better quality. Combination amongst the growers was necessary. Several members referred to the necessity for better facilities and for more careful handling of fruit on the railways, and, on the motion of Mr. Monks, it was resolved—"That in the opinion of this meeting the Government should be asked to provide better facilities for the handling and carriage of our fruit on the railways." Mr. Monks advocated the utilisation of apples not quite up to first grade for cider-making. This was a good, healthy beverage, and if a palatable article was put on the market at a reasonable price there would soon be considerable demand for it. Mr. Molineux said that the climate was against cider-making, as without expensive appliances for cooling fermentation was too rapid, and the cider of inferior quality. Messrs. Quinn and Laffer took exception to this statement. At Roseworthy Professor Perkins had made cider of very good quality, and at both the Melbourne and Adelaide Wine Shows Mr. J. H. Fourier, of Lower Metcham, had won prizes for cider, which had been very highly commended by the judges.

FODDER PLANTS FOR HILLS DISTRICTS.

Mr. W. Pearson, of Meadows Branch, read a paper on this subject. He was satisfied that dairying could not be carried on profitably in the hills unless heavy crops of green fodder were grown for use during the summer and autumn, except in a few favoured spots, where there was good natural grass throughout the year. A liberal allowance of wholesome green feed during the hot weather would treble the flow of milk. They had to consider which crops would give the most value in fodder, having regard to the cost. For the hills, in his opinion lucerne, mangels, sorghum, prairie grass, maize, and clover would give most satisfaction. All things considered, lucerne was the most profitable crop to grow on their stiff clay soils. He would sow the seed in April, with a light seeding of barley, oats, or rye for protection. The crop should be cut early for grain feed, or it will choke the lucerne. Lucerne gave a continuous supply of green feed from September to June, if properly treated. If not needed as green feed the first two cuttings can be made into hay. Good lucerne hay was the best possible winter feed for dairy cows. If liberally manured and well cultivated, four or five good cuts can be secured during the summer. Mangels illustrate the old adage, "What is worth doing is worth doing well." He knew of no crop that would respond

so readily or surely to liberal treatment; while, if not so treated, both in regard to cultivation and manure, the results would be disappointing. He advised giving a heavy coating of stable manure, and ploughing it under deeply in May. In July apply 4 cwt. to 6 cwt. of bonedust per acre, and plough it in. About the end of August plough lightly and sow the seed in drills, about 2 ft. to 2 ft. 6 in. apart. Thin out the plants to 4 in. to 6 in. apart at hoeing time, after which they will make rapid growth. In November or December every other plant, or two out of three plants, should be pulled, leaving them 2 ft. x 1 ft., or 2 ft. 6 in. by 1 ft. 6 in. apart, the latter being preferable if the land is rich and the plants growing strongly. A month later a heavy crop of leaves can be pulled, and it is a good practice at this time to loosen the surface with a cultivator; the oftener this can be done the better. He calculated that to grow them properly an acre of mangels cost £12 10s. to £13, but from 60 tons to 80 tons of roots, besides the summer pickings, will be good value for this outlay. Apart from the total yield, mangels had an added value from the fact that they could be drawn upon as required at any time from November to the following September. Sorghum, amber cane, and maize will produce heavy crops on ordinary potato land without manuring, if the land is well cultivated. He preferred broadcast to drilling the seed in the hills, as the plants were finer. Although good crops can be grown without manure, he was convinced it paid to apply some. Both maize and sorghum were best chaffed, and if a bushel of pollard is mixed with enough feed for twelve cows it will be found to increase the yield materially. It is a good plan to let this remain for twenty-four hours or more, as it appears to improve by heating in the heap. Various millets, the red and white clovers, and prairie grass will all yield profitably, but, taking everything into consideration, he thought that lucerne, mangels, and maize or sorghum best answered their requirements.

Mr. Downing stated that owing to attack by cutworms he found it practically impossible to grow mangels. In reply, Mr. Pearson stated that cutworms could be easily prevented from doing damage. He made it a practice to scatter a mixture of paris green, bran, and sugar on the land about eight or ten days after seeding, and again later on should the plants show any signs of attack. He mixed about 60 lb. bran, 1 lb. paris green, and 4 to 6 lb. dark sugar with sufficient water to make a crumbly mass. This amount was sufficient for half an acre. Mr. Griggs stated that he had known over 100 tons per acre of mangels grown on well-prepared land in England. Mr. Hughes spoke highly of lucerne for this district. On the heavy clay land Thomas phosphate gave splendid results when applied to lucerne. Maize was the cheapest fodder crop to grow on fairly moist land, and was unsurpassed for keeping up the milk supply during the dry months. It should, however, be fed liberally to the cows.

EXHIBITS.

Longwood Branch tabled specimens of boring insects attacking wattle roots, lucerne attacked by dodder, and several varieties of clover.

MILK FEVER.

Mr. F. Drogemuller, of Woodside Branch, read a paper describing the symptoms of milk fever in cattle, and its treatment with homeopathic medicines.

PIGS.

Mr. E. J. Oinn, of Longwood, read a short paper describing the results obtained in fattening pigs, partly on the waste from the garden, and a short discussion ensued.

COMMON AILMENTS OF STOCK.

Veterinary Surgeon Desmond gave a very instructive address on this subject. By means of blackboard sketches he illustrated the different organs of the horse and cow, and described the more general complaints and also methods of treatment. The way to give medicine, the application of blisters, and the treatment of wounds were also dealt with. The practice of giving drenches through the horse's nose was condemned as barbarous and cruel, and calculated to cause serious injury to the animal. Numerous questions were answered, and the hope was expressed that Mr. Desmond would

contribute articles to *The Journal of Agriculture* on the subjects dealt with that afternoon.

NEXT CONFERENCE.

It was decided that the next Conference should be held at Meadows.

SUMMER PRUNING OF FRUIT TREES.

Mr. G. Monks, Forest Range Branch, read a paper on this subject. The main aim of summer pruning was to produce fruit buds in positions where, under ordinary conditions, few or none would be developed; in other words, to convert spare wood growth into fruit shoots. The trees can be made to bear much earlier than usual by summer pruning, and the trees can be clothed with fruit spurs from the forks upwards, instead of having a long length of bare wood, with the fruit at the ends of the branches, where they are likely to be knocked about by the wind, and, when there is a heavy crop, cause the wreck of the tree. In carrying out summer pruning they needed to hit the time when there was sufficient sap flowing to form fruit buds, but not enough to cause wood growth. This work can only be carried out successfully with an open-centre tree. The best time to perform the work depended upon various circumstances, such as soil, rainfall, vigour of trees, etc. With deep, well-cultivated soil, and with a good rainfall, he was satisfied that summer pruning should not be commenced until March. He had experimented with his trees for several years, pruning some in each month from December to March. Those first pruned always made strong growth again; those pruned in January were nearly as bad; while the February-treated laterals made a weak, spindly growth, quite unsuited to fruit production. On the other hand, however, the trees treated in March, with few exceptions, gave very satisfactory results. He did not favour breaking the laterals, but would use a blunt pair of secateurs to cut them, as the wounds would not heal too rapidly, and there was thus less risk of fresh wood growth. As a rule, only three or four buds should be left on the spurs, but the Jonathan must be treated differently. This variety, as a matter of fact, did not respond satisfactorily to summer pruning. Care must be taken to leave the leaders unpruned until winter, as it is essential that they should make a fair amount of growth each year. Not the least advantage of summer pruning was that it greatly lessened the time occupied by pruning in the winter.

WHEAT-GROWING IN THE HILLS.

Mr. J. W. Vigar, of Mount Pleasant Branch, read a paper on this subject. Wheat-growing was combined with dairying, pig-raising, and grazing by most of the hills farmers, but it holds a very important position in respect to the farmer's sources of income, and in the near future would receive more attention than of late years. The introduction of improved methods of cultivation and harvesting machinery and the use of manures, so general in other parts, had not been adopted as yet to any extent in these localities. Their aim must be to obtain as much return as possible, with the least outlay, consistent with good management, and to achieve this the farmer must use implements that will perform the maximum of work with a minimum of hired service. The single-furrow plough must give place to the three- or four-furrow plough, with short mouldboards. The use of these large ploughs has only been possible since the advent of the seeddrill, as under the old method of broadcasting the longer mouldboard was required to give a fine seedbed. The main object now was to turn the land and bury the grass, breaking up the soil sufficiently to make a good seedbed. The actual depth to plough must depend upon the class of soil. Heavy, strong loam should be worked deeper than soil of a lighter nature. Fallowing was, owing to the heavy rainfall and the value of the land for grazing, unnecessary in this district. Besides, their soils did not do well if worked too much. Ploughing was done at end of autumn or early in the winter. In regard to manures, mineral super had not given him the results it did in other districts. He had tried numerous experiments with different kinds and mixtures of manures, and got by far the best results from a mixture of bonedust and super, or guano and super in equal parts. Every farmer must, however, experiment for himself in this direction. One drawback to wheat-growing that formerly existed, viz., risk of serious losses by red rust, had been practically removed owing to the introduction of rust-resistant wheats.

Some discussion followed on the use of manures, there being considerable difference of opinion as to the best manures for the Hills districts, and the quantity to apply.

AGRICULTURAL BUREAU REPORTS.

Golden Grove, September 22.

PRESENT—Messrs. Angove (chair), Milne, McPharlin, Harper, Ross, Maughan, Haines, Madigan, Buder, Rawlings, McEwin, White, N. J. and A. D. N. Robertson (Hon. Sec.), and about thirty visitors.

DAIRYING.—Mr. P. H. Suter, Government Dairy Instructor, gave a very interesting address on dairying. He referred to the unsatisfactory condition of much of the South Australian butter at present being exported, and indicated what he believed the inferiority to be due to. The necessity for cleanliness on the farm and in the factory, the treatment of the milk and the cream, were all referred to. He urged the necessity for improving the quality of their herds, and for proper attention to feeding.

Petina Well, September 26.

PRESENT—Messrs. W. Penna (chair), A. Penna, Thompson, Giles, and Fiddamann (Hon. Sec.), and two visitors.

SCRUB-CUTTING.—Mr. R. Penna forwarded a paper on this subject. He advised cutting the scrub early and cutting it low, as a little extra cost in this direction would save a lot of breakages of implements. Mr. Giles also advised cutting early, as the shoots would then make good growth before burning time. All agreed that the scrub should be cut close to the ground, and cocky chaff or straw around the stumps was mentioned as of much assistance in burning them.

Mundoora, September 23.

PRESENT—Messrs. Harris (chair), Mildren, Aitchison, Haines, Button, Shearer, Blake, and Gardiner (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress. Regret was expressed that nothing definite had been done to secure a fixed standard for wheat. Discussion also took place on the cleaning and harvesting of wheat. The Chairman stated that, in view of the remarks made at Congress, he was disposed to wait a while before purchasing a complete harvester.

Appila-Yarrowie, September 23.

PRESENT—Messrs. Francis (chair), Catford, Klemm, Stacey, Bauer, Becker, Keller, Daly, Bottrall, Brinkworth, Wilsdon, and Fox (Hon. Sec.).

HON. SECRETARY.—Mr. H. A. Bauer was appointed Hon. Secretary for ensuing year.

CONGRESS.—Delegates reported on proceedings of Congress. A discussion followed on the buying of wheat, and dissatisfaction was expressed at the action of Mr. J. C. Symons, of Crystal Brook Branch, in withdrawing his motion in favour of a fixed standard.

VETERINARY NOTES.—It was decided that the Hon. Secretary keep for reference a book into which tested veterinary recipes will be entered.

Quorn, September 23.

PRESENT—Messrs. Thompson (chair), Noll, McColl, Venning, Toll, Smith, Rowe, Finlay, Patten, Cook, and Walker (Hon. Sec.), and one visitor.

CONGRESS.—Delegates reported on proceedings of Congress. Mr. Brewster reported on visit to Agricultural College.

LUCERNE.—The Hon. Secretary tabled bundle of lucerne grown on a small plot of ground. With the aid of irrigation a plot 26 yards by 10 yards would, he believed, yield 5 tons of green feed during the summer.

Denial Bay, October 1.

PRESENT—Messrs. Smith (chair), Dunnet, Lowe, Starling, Meier, Croker, McKenzie, and Gale (Hon. Sec.).

ANNUAL REPORT.—Ten meetings held; average attendance, 7.5 members; papers read, five. Officers thanked and re-elected.

STANDARD BUSHEL.—Mr. Lowe read a paper on "Marketing Wheat." It was with regret that he noticed the discussion at Congress on this subject had not achieved anything to make the system of marketing wheat more satisfactory. He believed the reputation of South Australian wheat would continue to deteriorate so long as the present method of buying and selling wheat existed. The quality of their wheat sample had been reduced by the buyers not encouraging farmers to produce a sample above a given standard. While the system of fixing the standard late in the season was unsatisfactory, yet at the same time it would not be possible to get a fair standard from the earliest samples, as these were usually heavier than the wheat reaped a little later. They were told that a low fixed standard would pay the wheatbuyers, and that the farmers profited by a high standard, as their wheat would command more in the English market. As, however, most of the farmers' wheat is sold before the standard could be fixed, he failed to see where the farmer would benefit. The present system of docking wheat under standard was also very unsatisfactory. The better and fairer way would be to dock on the weight of wheat. He was convinced that if they were to get a better system of wheat trading and a better reputation for their wheat the farmers must take the matter in hand themselves. The traders were doing so well out of the present system that they will only oppose any proposal to alter it. After some discussion it was resolved to ask the Branches to consider the following suggestion:—"That a unit be fixed of what is considered a fair sample of South Australian wheat, and that this particular unit (say, 62 lb. per bushel) be used as a standard for all wheat bought and sold in the State, and that all wheat weighing above or below this fixed unit be paid extra for and docked *pro rata* in the weight of wheat." Members are of opinion that this fixing of the unit should be something altogether outside the fixing of the standard required by traders for the sale of wheat in foreign markets. [As the price of our wheat is governed by the price realised in the London market for our wheat, and that price would be based on the traders' standard sample, it is not clear in what way the proposal of the Denial Bay Branch is to operate.—ED.]

Riverton, September 24.

PRESENT—Messrs. Davis (chair), Hannaford, Gravestocks, Badman, Camac, James, and Cooper (Hon. Sec.).

CONGRESS.—The Hon. Secretary reported on proceedings of Congress.

MEMBERSHIP.—The resolution carried at Congress in favour of removal of the present limit of membership was viewed with approval.

ROSEWORTHY COLLEGE.—It was decided to arrange with the Principal for the members of the Branch to visit the College during October.

Reeves Plains, September 23.

PRESENT—Messrs. Folland (chair), Cordon, Carrol, Day, and McCord (Hon. Sec.), and two visitors.

CONGRESS.—Delegates reported on proceedings of Annual Congress.

AGRICULTURAL SHOWS.—Discussion took place on paper on this subject read at previous meeting. Members were unanimous that Mr. Winton's suggestion to have only four shows outside Adelaide was wrong. Several members thought that any township that could afford to get up a show was deserving of success. In regard to Mr. Winton's reference to judging, members were of opinion that country judging compared very favourably with the awards at the Adelaide Show.

Port Lincoln, September 17.

PRESENT—Messrs. Laidlaw (chair), Cavanagh, Reuter, Chapman, Bruce, and Sage (Hon. Sec.).

BAGS AS WHEAT.—Mr. Bruce considered it an injustice that the farmer should pay 63d. each for his wheatsacks, and be compelled to sell them as wheat, as, at 2s. 6d. per bushel for wheat, the farmer lost 5d. on every bag. The Hon. Secretary pointed out that under either system the farmer undoubtedly paid for the wear and tear and loss on the bags. When the practice of buying wheat "bags in" was first adopted some of the buyers gave the farmers the option of buying or borrowing the bags; but they gave 1d. per bushel less to the man who borrowed the bags.

HAYMAKING.—Some discussion took place on the best time to cut the crop for hay. Members were unanimous that the crop should be cut as soon as the bloom was off. If corn was needed in the feed, it should be supplied in the form of oats, which grow well in this district. The Hon. Secretary was averse to using rust-resisting wheats for hay, as the fibre was more indigestible than with the ordinary wheats. It was agreed by several members that rusty wheats made bad hay. The Hon. Secretary said that when rust was prevalent the farmer would naturally cut the non-resistant varieties for hay, and by cutting a little earlier than usual the hay would be all right.

Eudunda, October 3.

PRESENT—Messrs. Gosling (chair), Paech, Weil, Walter, J. A., E. T., and J. Pfitzner, von Bertouch, Schwarz, Krummel, and Marshall (Hon. Sec.).

ANNUAL REPORT.—Eight meetings held, with average attendance of eight. Various experiments of an important nature had been carried out during the year; but it was regretted that so few visitors took any interest in the work. Messrs. F. H. Walter, H. D. Weil, and W. H. Marshall were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. Delegates to Congress reported on proceedings.

Naracoorte, September 3.

PRESENT—Messrs. J. G. Forster (chair), Malone, Coe, H. A. Forster, Williams, Wardle, Caldwell, Attiwill, and Schinckel (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members were unanimously opposed to Kapunda proposal for a 60-lb. standard for wheat as too low for a fair sample of South Australian wheat.

RESOURCES OF THE DISTRICT.—The Chairman read a paper on this subject, dealing with the Naracoorte and Penola country. This covered about 750,000 acres, two-thirds of which was arable, and the balance inferior and scrub land. With the exception of a few farmers and the Coonawarra Fruit Colony, the whole area was devoted to sheep and a few cattle. Insufficient cereals for local consumption are grown, potatoes have to be imported from Mount Gambier, and even the supply of dairy produce does not meet the local demand. With the exception of a little fruit, the exportable value of the produce of this large area of country was wool, worth about £45,000. He quoted largely from Professor Perkins's articles, showing the possibilities of the South-East, and, in view of the splendid results obtained by the use of fertilisers on even the poor lands in the district, it was to be regretted that the large landholders could not see their way to making better use of the country. They would not only benefit themselves, but would also give employment to more people than at present. The late manager of Morambro Station proved that it paid to have the land cultivated and manured for a few years, and there were always plenty ready to farm such land on the share system. With their average rainfall of from 20 inches to 25 inches they could be sure of profitable returns if the land was properly cultivated. He had been told by a visitor to New Zealand that much of their plain land was similar to that in New Zealand, where, by sowing suitable grasses, the carrying capacity had been increased from one sheep per acre to six or eight sheep.

Dawson, September 24.

PRESENT—Messrs. Renton (chair), Drayson, Just, Warner, Meyers, Collins, Kilkery, and Nottle (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Annual Congress.

COMPLETE HARVESTERS.—Mr. Warner read a short paper on this subject. While he was satisfied that the harvester was a splendid machine, he thought several improvements would need to be made in it. He did not think it would prove so useful in a light crop as in a heavy one. While it would be cheaper for a man with old machinery to buy a harvester, he would advise the farmer possessing a good stripper and winnower to stick to them for a few years. One great advantage with the harvester was that it could be kept working for a longer period of the day than the ordinary stripper, or even the damp-weather stripper. When reaping in damp weather it was a good plan to spread the grain on a tarpaulin to prevent its heating. The draught of the harvester was greater than that of the stripper. He used five draught horses, and had two men to work his harvester.

WASHED LAND.—Some discussion took place on the best way to reclaim the large holes and gutters caused by heavy rain. Members had found it best to put large stones at the lower end of the wash, and allow the sand carried by the water to fill up the holes.

Penola, October 8.

PRESENT—Messrs. Darwent (chair), McKay, Peake, Miller, Ricketts, Richardson, Stoney, Alexander, and Allnutt (Hon. Sec.).

CONGRESS.—Delegates reported at length on proceedings of Congress. It was decided to send a letter of condolence to the family of the late Mr. F. E. H. W. Krichauff.

Arthurton, September 22.

PRESENT—Messrs. Hawke (chair), Crosby, Lamshed, Rowe, Welch, and Palm (Hon. Sec.).

POULTRY.—Mr. Crosby initiated a discussion on poultry raising, dealing with the poor results obtained from eggs purchased from other parts. He thought this was largely due to the fact that the eggs were not put aside for two or three days before setting them. The journey by road or rail shook the eggs about, and it was imperative that they be left quiet for a few days after receiving them.

Kanmantoo, September 23.

PRESENT—Messrs. Mills (chair), Mullins, Thiele, R. H. and J. Downing (Hon. Sec.).

RABBITS.—Considerable discussion on this subject took place. The past season had been very favourable to the increase of rabbits. The green feed started early, and the rains were of such a steady character that few of the burrows, and only a small percentage of the nests were destroyed by water. Members thought that in a district like this the rabbits could be exterminated by united action on the part of the landowners at the right season of the year. Best success was obtained by the use of phosphorus in February, and by dealing with the burrows in June. Farmers with moderate-sized holdings had proved that it was a fairly easy matter to clear the land, and with the larger holdings it was a question of employing labour proportionate to the acreage to secure equally good results. Simultaneous action throughout the district was, however, necessary. This had not been secured in the past. Wire-netting was considered an effective aid in overcoming the difficulty, but it involved much expense. It was recognised that to secure full success the co-operation of the Government was necessary. The rabbits were destroying the best and sweetest herbage—a fact which called for prompt action on the part of all concerned.

Bowhill, September 24.

PRESENT—Messrs. Dohnt (chair), Norman, A. and E. Weyland Burton, Walters, N. and S. Johnson, Tyler, J. Waters, jun., and Kildea (Hon. Sec.), and four visitors.

FIELD TRIAL.—A field trial of cultivating implements was held at Bowhill under the auspices of the Branch on August 25. About eighty farmers attended, and a number of leading firms were represented, the day's operations being instructive and interesting.

WATER SUPPLY.—Members met at Mr. Johnson's homestead for the purpose of inspecting the boring operations being carried on. Mr. Johnson and his sons showed the drill at work, and it was agreed that this was a better means of obtaining water than by well-sinking, the cost of the pipes for the bore, pump, and mill amounting to less than that of sinking a well.

Carrieton, September 26.

PRESENT—Messrs. Gleeson (chair), Harrington, Manning, Cogan, O'Halloran, Ormiston, Fisher, Kaerger, Hupatz, Steinke, Davies, and Bock (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Annual Congress.

DAIRYING.—It was decided to ascertain on what terms the Department could assist the Branch to purchase a purebred bull. [The Department has disposed of all the bulls purchased some years ago, and the practice of paying half the cost of approved animals purchased by Branches has been discontinued.—Ed.]

Virginia, September 20.

PRESENT—Messrs. Hatcher (chair), Taylor, Pavy, Huxtable, Sheedy, Strempel, Thompson, Baker, Nash, Odgers, and Ryan (Hon. Sec.), and a number of visitors.

POULTRY.—Mr. P. Thompson read a short paper on this subject. He strongly advised the beginner to stick to a breed he knew something about, and also to go in only for purebred fowls, unless crossing for table purposes. The purebred fowl cost no more to keep than the mongrel, and would lay more eggs. Besides this, one could always sell a few sittings of eggs, and also any spare cockerels of pure breed at enhanced prices, and so add considerably to the returns. A flock of purebred birds was also much more pleasing to the eye than a mixed lot. After many years' experience, he favoured the Silver Wyandotte as the best all-round bird for the farm. They were very hardy, good winter layers, good foragers, fine table birds, and remarkably free from disease. They were splendid sitters, careful mothers, but plucky enough to fight to protect their chicks. They would often start laying again when their chicks were about five weeks old.

QUESTION BOX.—A number of questions were asked. The majority of members were agreed that the main reason that new land did not now produce such good crops as the same kind of land did in the early days was that grazing the land for so many years had impoverished it to a certain extent. Members preferred mating a blood stallion to a draught mare to the reverse cross.

CONGRESS.—The Chairman reported on proceedings of Congress.

Balaklava, September 17.

PRESENT—Messrs. Robinson (chair), Anderson, Black, Hams, Manley, Spillane, Tuck, and Burden (Hon. Sec.).

MOTIVE POWER ON THE FARM.—Paper read by Mr. F. Coleman, of Saddleworth Branch, on this subject, was discussed. Several members considered the oil engine much superior to horseworks on the farm, especially for chaff-cutting for a number of horses.

Elbow Hill, September 17.

PRESENT—Messrs. Dunn (chair), Elleway, Rhen, Ward, and Wills (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members favoured a permanent standard of 63 lb. per bushel, with extra payment for over-standard wheat.

Longwood, October 1.

PRESENT—Messrs. Antuar (chair), Vogel, Cheeseman, T. G. and E. J. Oinn, Russell, McGavisk, and Hughes (Hon. Sec.), and eight visitors.

CODLIN MOTH.—Mr. O. Peterson wrote fully concerning his results from use of arsenite of soda and Bordeaux mixture combined, and was accorded a vote of thanks for his courtesy. Mr. Oinn tabled several codlin moth chrysalides attached to the bark of an apple tree. When gathered, on September 25, they were still in the caterpillar form, but some had changed to moths. Several of those present reported having found empty chrysalis cases already this season, and some had seen what they believed to be the moth.

THE LATE MR. KRICHAUFF.—A resolution expressing appreciation of the services rendered by Mr. Krichauff and regret at his death was carried.

CIDER-MAKING.—Mr. Vogel read a paper on cider-making for home use. He had made thousands of gallons of cider in the old country, but not in this State. Expensive appliances were not necessary to make good cider. Cleanliness in all stages of the operation of cider-making was essential to success. Good, ripe, clean fruit should be pulped with a wooden stamper in a wooden trough, then placed in the press and the juice expressed. The juice should then be placed in a clean barrel to ferment. The barrel should be kept quite full, a little juice being put aside in another receptacle to replenish the barrel from time to time while fermentation is going on. The barrel should be kept in a cool place, and as soon as fermentation is over should be bunged down. If the cider is to be kept for more than a year it will require to be racked at the end of the winter. Mixed sorts of apples, so long as they are sound and ripe, give better cider than a single variety, though the Bostover is usually considered the best cider apple. To fumigate the casks before use, melt some sulphur and dip a strip of linen in it; put about 1 square inch of the linen on the end of a wire, set it alight, and hold it in the cask until it burns out.

BITTER PIT.—Mr. Oinn tabled samples of Cleopatra apples, picked on February 12, to test whether early picking would prevent attack of bitter pit. These apples were small, slightly shrivelled, but in good condition and free from pitting. Apples left on the tree until ripe were attacked by pit.

Mount Bryan East, September 24.

PRESENT—Messrs. T. Wilks (chair), Bryce, Honan, Teddy, Dare, J. and E. S. Wilks (Hon. Sec.), and several visitors.

INDUSTRY ON THE FARM.—Mr. Bryce read a short paper on this subject. The period between seedtime and harvest was often referred to as the slack time, and it would be to the advantage of the farmer if he utilised this time in attending to his fences, fixing gates instead of slip panels, attending to the harness, which should be thoroughly cleaned and well oiled at least twice a year, and generally in putting things straight on the farm. While at certain seasons of the year the farmer could not give his attention to such matters, they would find it profitable on every farm, whether leasehold or freehold, to do their best to keep everything in good order.

MILK TESTER.—It was decided that the milk tester purchased by the Branch should be available to non-members on payment of a small fee. Members desire to encourage the keeping of a more profitable type of cow, which could be done by ascertaining which were the poorest milkers, and disposing of them at the first opportunity.

Meadows, September 26.

PRESENT—Messrs. Pearson (chair), Haines, Usher, Clatworthy, Ellis, Wright, Nicolle, W. J. and C. E. Stone (Hon. Sec.), and one visitor.

MILK YIELDS.—Discussion on "testing and weighing milk" was continued. Members were agreed that it was necessary for the dairyman to know, not only which cows yielded the most milk, but which were the best for butter.

ROSEWORTHY COLLEGE.—The Hon. Secretary read an interesting paper on a recent visit to the College.

Richman's Creek, September 26.

PRESENT—Messrs. Knauerhase (chair), Roberts, Donovan, Hilder, J. S. and J. McSkimming, F. H. and J. H. Lehmann, Nicholson, Gebert, Wright, Knox, H. and J. M. Kelly (Hon. Sec.), and six visitors.

REARING FOALS.—Members were agreed that early foals did best in this district, as they got the full benefit of the green feed.

STANDARD BUSHEL.—Mr. J. J. Gebert read a paper at previous meeting on this subject, in which he advocated a standard of 65 lb. per bushel. Members were agreed that this was too high for ordinary conditions.

CONGRESS.—Mr. F. H. Lehmann reported at length on proceedings of Annual Congress.

Amyton, September 22.

PRESENT—Messrs. Mills (chair), J. T. and Walter Gum, Kelly, Wheadon, A. and J. Gray, Bourke, and William Gum (Hon. Sec.), and four visitors.

CONGRESS.—Delegates reported on proceedings of Annual Congress, and discussion took place on several of the papers.

IRRIGATION.—Mr. J. Kelly read a paper on the possibilities of irrigation. Taking the valley of the Willochra, there was an area of country about sixty miles long by five to ten miles in width that had big possibilities before it in the way of irrigation. It was surrounded on three sides by hills, and afforded splendid facilities for the conservation of flood water. Besides this, they had proof that large supplies of artesian water could be tapped. That the land would respond splendidly to irrigation was proved by the magnificent herbage which grew on land that had been flooded. While they should not lose sight of these possibilities, he would like to impress on the members the fact that they could do much to improve their positions by conserving and diverting flood waters on to small areas of land on which fruit, vegetables, and summer fodders could be grown. As dairying and stock-raising were becoming the chief industries of the district, the value of green feed during the summer months could not be over-estimated. Lucerne would do splendidly along the watercourses where it could be flooded, and he would advise all of them to try some. A little seed could be sown with the wheat on the lower ground, and generally it would produce a fair bite after the crop was reaped. A good discussion followed. Members did not think it would pay to irrigate wheat, but admitted that much could be done, by irrigating small areas, to grow fruits, vegetables, and fodder.

Bute, September 20.

PRESENT—Messrs. Trengove (chair), A. and H. Schroeter, Sharman, Hamdorf, Barnes, Commons, and McCormack (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Annual Congress, and a number of questions were answered.

FIELD TRIAL.—Members supported proposal to hold field trial of harvesting implements on Messrs. Lomman & Freeman's farm, near Moonta. Opinions were divided as to the wisdom of postponing trial of cultivating implements from August until March.

Mount Remarkable, September 22.

PRESENT—Messrs. Casley (chair), Challenger, Kaerger, Giles, Foot, T. P. and G. P. Yates, McIntosh, Morrell, Smith, and O'Connell (Hon. Sec.).

CONGRESS—Delegates reported on proceedings of Annual Congress and on visit to Roseworthy College.

HORSE-BREEDING.—Mr. Kaerger read a short paper on this subject. He had had considerable experience with the breeding of horses for farm work and for the roads, and he found that the progeny of a draught stallion mated to a blood mare was strong, active, and hardy. Some people insisted that they needed weight for wagon work, and, while this was true, he would prefer to put an extra horse in the team to give the weight rather than use heavy horses. The lighter team would eat no more, and would stand the travelling better, as the heavy horses get leg-weary and very slow from constant travelling. In the North, where travelling teams are largely dependent upon the feed they can pick up along the journey, the lighter horses keep in much better condition. For breeding a lighter class of horses for carriage or saddle work or for export, he would mate one of these crossbred mares to a blood stallion. He preferred the cross between blood mare and draught stallion to the reverse cross, as, in his opinion, the latter were not so hardy, active, or so plucky as the other.

Meningie, October 8.

PRESENT—Messrs. Williams (chair), Robinson, Shipway, R. and H. Scott, Hiscock, Botten, Hackett, and Tiller (Hon. Sec.).

CONGRESS—Delegates reported on proceedings of Congress.

HAYMAKING.—Mr. Tiller read a short paper on "The Best Time to Cut Hay." If they observed the natural grasses, he believed they would find that stock fattened best when the seed was just beginning to form, but the herbage was still green, and he thought this could be accepted as a good guide to hay-cutting. Their object was to conserve the most nutriment in a palatable form. If they got a half-developed grain in the hay it was at the expense of the straw. With overripe hay stock would waste more than with green hay, eating the heads and leaving the rest. It was not the grain, but the stalk and flag, that they should conserve as hay. Some people claim that the riper hay makes better chaff, but what they should say was that it made heavier chaff. They should try to produce hay of the best quality, and not of the heaviest weight. He would cut the hay in the bloom, or dough, stage, and if grain was needed add it to the chaff as a fully developed grain. Considerable discussion ensued, members generally agreeing that hay cut just after blooming was the best for stock.

Minlaton, September 17.

PRESENT—Messrs. Newbold (chair), Mayer, Boundy, J. and H. W. Martin, Vanstone, Evans, A. & J. McKenzie (Hon. Sec.), and one visitor.

ANNUAL REPORT.—Nine meetings held, with an average attendance of 8.5 members. Four papers had been read and discussed, but several of the members had failed to carry out their promises to read papers in their turn. This was not fair to the other members or to the Hon. Secretary. He thought the lack of interest shown of late in the Bureau meetings was largely due to the severe economy of the Government rendering it necessary for the Editor of *The Journal of Agriculture* to cut down the reports of meetings to such an extent as to convey the impression that little or nothing was done by the Branches. Another reason for this lack of interest was the failure of the members to realise the duties attached to membership of the Bureau, and he had for a long time thought it would be a good plan if at each annual meeting half the members were retired, but were made eligible for re-election. This would give each one two years' membership and afford others an opportunity to join the Branch. Messrs. H. W. Martin, J. D. Mayer, and J. McKenzie were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Arden Vale, September 26.

PRESENT—Messrs. Warren (chair), Fricker, Pearce, Francis, Miller, Rogers, Williss, Klinberg, and Hannemann (Hon. Sec.), and six visitors.

CONGRESS.—Delegates reported on proceedings of Congress and Show, and on visits to Roseworthy College and the Outer Harbour.

BUREAU WORK.—The Chairman read a paper on "Adverse Criticism of Bureau Work." The Agricultural Bureau was subject to a good deal of adverse criticism, but if of a healthy character this can only result in good. That there were signs of decay in the institution was not supported by statistics, which show that the Branches are on the increase. Of the Northern Branches it may be said that they were established in better times, and that they had survived the long drought was an instance of the wonderful vitality of the Northern farmers. Though it was of the utmost importance to learn how to farm with a light rainfall and to meet the varying conditions of their climate, it was obvious that without some amount of natural co-operation their efforts in agriculture cannot meet with much success, and however abundant information Bureau members may have it cannot be put into practice without cash. It was urged with some truth that Bureau meetings suffer from repetition, or that their discussions, like many Parliamentary debates, were characterised by more force than logic. This continued repetition can only be excused on the plea that about 1,500 men were always pegging away at the practical side of the same subject. They all knew that the theoretical and speculative side of a question always gives more room for discussion, while, at the same time, to be of any value, it needs peculiar fitness and a special training. Many valuable ideas first see the light in the Bureau meetings, afterwards to be seized upon and elaborated by agricultural reporters and others, who thereupon appropriate all the honour and glory of the discovery. The impeachment that they were not masters of debate must also be suffered in silence. The consummate manner in which Mr. Darling wiped out the Congress on the standard bushel debate was a melancholy instance of this. In Professor Lowrie the farmers lost their champion of standard bushel rights, as well as a wise adviser in other directions. One fact their critics were apt to forget was that information that might be an oft-told tale to them would be quite new to one just beginning farming in this country, and the younger members of the agricultural community will find a mass of practical information, suited to the varying districts of the State, in the reports of the Bureau meetings.

Redhill, September 20.

PRESENT—Messrs. Treloar (chair), Button, Wheaton, Robertson, and Lithgow (Hon. Sec.).

CONGRESS.—Mr. Wheaton reported at length on proceedings of Annual Congress.

Onetree Hill, September 22.

PRESENT—Messrs. J. Bowman (chair), F. and G. Bowman, Blake, Cowan, Flower, W. and E. A. Kelly, and Lucas (Hon. Sec.).

BLACK RUST.—Mr. E. A. Kelly showed samples of wheat attacked by what was known as black rust. The flag alone appears to be attacked, but the injury is sufficient to kill the plant. An early sown crop was the only one affected on his land. Three kinds of wheat were sown in the paddock, and all were equally affected.

TAINTS IN MILK.—Members thought all taints due to feed could be removed by aerating the milk.

DESTRUCTION OF RABBITS.—Mr. Flower stated that he had used bisulphide of carbon with success in destroying rabbits in the burrows. He added 1 gallon of water to 7 lb. of bisulphide, which he kept in an airtight vessel; to short sticks, cotton waste, wool, or other soft material was tied, and was dipped in the liquid and inserted in the burrows without being ignited. The burrows were then closely covered over to keep in the fumes. To make a complete success one or two subsequent visits should be paid to the burrows.

Rhine Villa, September 23.

PRESENT—Messrs. G. A. Payne (chair), F. F. Payne, Schick, Lewis, Mickan, Pannach, and Vigar (Hon. Sec.).

THE CROPS.—Some discussion took place on the state of the crops and the effects of the dry weather. Several members reported that, whereas early in the season the crops on the ploughed land looked better than those on fallow, since the dry weather set in the former had been at a standstill, while on the fallow the crops had made good progress. Members were agreed that to secure the best results all the land to be cropped, not even excepting the sand country, should be fallowed. Rust was reported from across the river, but crops in this district were stated to be free.

Balaklava, October 8.

PRESENT—Messrs. Robinson (chair), Black, Neville, Tuck, Thomas, Thompson, and Burden (Hon. Sec.), and one visitor.

THE AGRICULTURAL DEPARTMENT AND THE SHOW.—Mr. A. W. Robinson read a paper on "A South Australian's Visit to the Melbourne Show." He wished to compare the efforts of the Victorian Department of Agriculture to make the national show a means of educating the producers with those of South Australia. The Victorian Department has erected a permanent pavilion in the showground, and he was particularly struck with the variety of instructive exhibits and efforts made to make the whole show educational. Dookie Agricultural College was represented by a fine display of cereals in straw and grain, olive oil, wines, various fodder plants, all nicely arranged and labelled. The Forestry Branch was represented by a splendid display of native timbers, polished and unpolished. In frozen produce, exhibits of produce were shown. These had been obtained in London and sent to Victoria to show what Russia, Norway, Canada, and other countries were exporting to Great Britain to compete with Australian products. In the dairy branch practical lessons in cheese-making, the testing of milk, etc., were given by the officers. The laboratory was represented by exhibits illustrating the results of field experiments and the laboratory work. Tobacco leaf grown on the Edi tobacco farm was shown. Then another very valuable exhibit consisted of a collection of 137 native grasses and 109 introduced species, all labelled with botanical and common names, their qualities, and their suitability to different districts. Cultivated sorghums and millets to the number of forty were on view, also illustrations of poultry affected by different diseases. In other directions also the Victorian Government showed that they desired to make the Royal Show what all shows should be, viz., a means of educating the producers of the State. During each afternoon of the show the officers of the various branches of the Department delivered short lectures, using the exhibits to illustrate their remarks. If they contrasted this with the representation of the South Australian Department of Agriculture at the Adelaide Show, they would realise how differently the Governments of the two States viewed this important subject. He had no wish to decry the Roseworthy College or the Agricultural Department. The fault lay in the very meagre amount voted by Parliament, which was only about one-fourth of what Victoria spent on its Department. As South Australia was a producing country, rather than a manufacturing one, the agricultural interests should be fostered by the Government. After some discussion, it was resolved that it was desirable that the Branches of the Bureau should impress upon the Department of Agriculture the necessity for using the Royal and other shows to educate the producers.

Kapunda, October 1.

PRESENT—Messrs. O'Sullivan (chair), Windebank, Pascoe, Flavel, Byrne, Daly, O'Dea, Weckert, Teagle, and Holthouse (Hon. Sec.), and one visitor.

CONGRESS.—Mr. Flavel reported on proceedings of Annual Congress, and some discussion in reference to the fixing of the f.a.q. standard for wheat took place.

Mount Gambier, October 8.

PRESENT—Messrs. Edwards (chair), Mitchell, Barrows, Kennedy, Ruwoldt, Williams, Watson, Wilson, Schlegel, and Collins (Hon. Sec.).

WEEDS.—Mr. Wilson tabled specimen of Cape tulip (*Homeria* sp.), and Mr. Ruwoldt a plant of buttercup, which he stated was spreading rapidly in some parts of the district. Stock would not touch the plant.

BRANDS ACT.—The proposed amendments to this Act were discussed. Members were in favour of the following provisions;—Compulsory registration of earmarks for sheep; fire brands for sheep sold out of pound; waybills for travelling stock; earmarks for sheep introduced from Victoria. Members did not think it necessary for waybills to be attested before a justice of the peace.

UTILISATION OF POOR LAND.—Mr. Collins initiated a discussion on this subject. He thought lucerne and wattles could be profitably grown on their so-called poor lands. His brother sowed lucerne ten years ago on poor, sandy soil that would not grow grain. The results had been very satisfactory. Last year he sold one cutting for £1 per acre as it stood, and a second cutting for 15s. per acre. This was on pure sand. They found it better to cut the crop and feed it rather than to graze it. Last year he put in 20 acres in September, and it was now looking well. Mr. Barrows had found it difficult to get lucerne to do on the sand, though once it was established it grew well. Some discussion on cleaning lucerne of weeds took place, harrowing after cutting being recommended. The Chairman had got best growth on rich land from autumn-sown seed. The Secretary read letter from Mr. D. Norman, sen., in reference to growing wattles on light land. He ploughed the land, harrowed it, then broadcasted the seed at the rate of 4 lb. per acre, harrowing the land down fine afterwards. Seed was soaked for twenty-four hours in hot water before sowing. He stripped £20 worth of wattle bark and obtained 2,000 hop poles from this acre. The growth of wattles was as thick as ever now, though the first and only time seed was sown was twenty-three years ago. The Chairman stated that on poor land in the Hundred of Kongorong they sowed about 70 acres to the broadleaf wattle. It was seven or eight years before they got any return, but the different strippings had realised £64, £80, and £114, and this year's returns would come to about £200. He also expected to take off another £100 worth of bark next year, and he was certain that the best use to make of this poor land was to grow wattles.

JUDGING AT SHOWS.—The Hon. Secretary suggested that the Agricultural Societies should combine to have stock judged by points, in order that visitors would know why the prizewinners were adjudged best. Mr. Mitchell thought they would not be able to get judges, as many who now acted could not judge by points if they tried. The Hon. Secretary thought the difficulty was that the Agricultural Societies were now run as money-making concerns, instead of being used for educational purposes.

Port Broughton, October 13.

PRESENT—Messrs. W. R. Whittaker (chair), W. H. Whittaker, Gardiner, Pattingale, Evans, Harford, Barclay, and Dalby (Hon. Sec.), one hon. member, and one visitor.

SUCCESSFUL AND UNSUCCESSFUL FARMING.—The Hon. Secretary read a paper on this subject. He referred to the difference in the management of farms and the results obtained by the owners of adjoining land. Some had good stock, good fences, neat outbuildings, comfortable homesteads, and good crops, while just across the road they would see the reverse. In many cases the men started under equally good circumstances, and yet, under similar conditions of soil and climate, one succeeds and the other fails. The reason for this must lay in the men rather than in their conditions. It would generally be found that the successful farmer saw that his stock were regularly fed, the work of the day planned out, and the farm worked on a system. In this district this meant one cereal crop on fallow land, then leaving it out for one, or, if the holding is large enough, two years' grass. Liberal manuring, careful selection of suitable varieties of wheat, the use of the best machinery for the work, care and attention to such machinery, all receive attention.

Waste of hay is avoided by thatching the stacks, and also in protecting them from the poultry. Stock are kept in good condition, instead of being allowed to forage in bare or scanty paddocks when seeding is finished. Wool and other products of the farm are got up in order to best advantage, with corresponding improvement in the returns. Working on these lines the farmer has everything done in season, and keeps well up to his work. Generally if enquiry is made it will be found that the unsuccessful man works without any system, and his operations are generally the reverse of what they should be. Probably partly this is due to indolence or other failing, and perhaps to the fact that the man is not a good manager, though industrious and painstaking. He thought the latter could learn something to his advantage and to the advantage of the State through the medium of the Agricultural Bureau and *The Journal of Agriculture*. The latter contains information of interest to farmers on every subject connected with their work, and should be read by every farmer. Members generally agreed with the paper.

HOMESTEAD MEETING.—This meeting was held at Mr. Pattingale's homestead, and after the usual inspection members and friends were entertained by Mr. and Mrs. Pattingale.

Davenport, September 29.

PRESENT.—Messrs. Hodshon (chair), Holdsworth, Roberts, McDonald, and Lecky (Hon. Sec.).

GARDENING.—Mr. J. Roberts read a paper on "Gardening in the Flinders Range." In the Flinders Range there were many rich gullies which could be made to yield profitable returns. The greatest drawbacks, however, were the very small rainfall, the absence of running streams of water, and the scarcity of springs. Still, within the hills they had natural reservoirs in the shape of springs in some places, while in others large quantities of water could be conserved at a small expense. They had many instances in America and elsewhere of greater difficulties being overcome, water often being brought for many miles. In respect to gardening the question, of course, was: Given the water, would there be sufficient demand for the produce to pay? While he admitted that the local demand was not very extensive, still it would suffice to take all that three or four extensive gardens could produce. It ought not to be necessary to send all the way to Adelaide for vegetables which, bruised and stale as they are, cost the consumer too much. Considerable discussion took place, and it was generally admitted that the crux of the whole question was the cost of water for irrigation.

CONGRESS.—Delegates reported on proceedings of Congress.

Wilson, September 24.

PRESENT.—Messrs. Harrison (chair), Barnes, Sexton, Gill, Need, Meyer, Nelson, and Neal (Hon. Sec.).

STANDARD BUSHEL.—Discussion on this subject took place. Members were unanimous in their opposition to any standard under 61½ lb. per bushel, being of opinion that a low standard would be against the interests of the farmers. Members were also opposed to a permanent standard, but thought all marketable samples should be considered when the standard was being fixed for each season.

Johnsburg, September 24.

PRESENT.—Messrs. Masters (chair), McRitchie, Potter, Caughlan, Chalmers, and Johnson (Hon. Sec.), and three visitors.

CONGRESS.—Delegates reported on proceedings of Congress.

DESTRUCTION OF RABBITS.—Mr. Caughlan reported that he was using phosphorised pollard very successfully for the destruction of rabbits, and thought this was the best agent for dealing with the pest at this time of the year, as the rabbits took it very readily.

Port Elliot, October 15.

PRESENT—Messrs. McLeod (chair), Pannel, Green, and Hargreaves (Hon. Sec.).

EXHIBITS.—Mr. Pannel tabled specimen of weed that had spread considerably in the district of late years. Neither horses, sheep, nor cattle would eat it. [This is an introduced weed, *Fumaria officinalis*, which does a lot of harm in the cereal crops in many parts of the South.—Ed.] Mr. Green tabled fine samples of strawberries.

STRAWBERRIES.—Mr. Green recommended Edith strawberry for cultivation, being, in his opinion, the best of the early varieties. He advocated renewing the beds every third year. The best way to do this was to dig up and replant about one-third of the area each season.

Gumeracha, September 26.

PRESENT—Messrs. Monfries (chair), Moore, Hannaford, Norsworthy, Bond, Stephens, Jamieson, Sandercock, and Lee.

CODLIN MOTH PARASITES.—Mr. Hannaford read extract from paper, in which it was stated that a parasite of the codlin moth had completely eradicated that insect in one part of Spain. It was decided to refer the matter to the Council of Agriculture, and ask whether the statement was correct. [The members of the Council are not in a position to say whether this is so, but the statement referred to was brought before them nearly eighteen months ago, with a request that the Government should pay portion of the expense of sending some one to Spain to search for the insect. As, however, there was no evidence in support of the claim that such a parasite existed, the Hon. Minister decided that he could not recommend the Government to incur any expense in the matter. See page 249, November, 1903, issue.—Ed.]

Lyndoch, October 22.

PRESENT—Messrs. Kennedy (chair), Warren, Mitchell, Woolcock, Ross, H. and E. Springbett (Hon. Sec.), two honorary members, and four visitors.

APRICOT DISEASE.—Two members reported apricot trees suffering from some disease, which was suggested by Mr. Quinn to be due to climatic or soil conditions, and by others as the result of injury caused by hail.

WEED.—A visitor tabled a weed which was proving very difficult to eradicate.

TICK REGULATIONS.—Mr. J. Kluge read a paper dealing with the restrictions imposed by the Victorian Government on imported poultry.

Elbow Hill, October 18.

PRESENT—Messrs. Wake (chair), Elleway, A. and W. Spence, Harvey, Storey, and Wills (Hon. Sec.), and two visitors.

AGENCY NUISANCE.—Some discussion took place on the numerous agents travelling the district, members being, as they termed it, "full up" of these agents. It was decided to follow the example of Arthurton Branch, and decline to deal with agents, but to buy direct from the principals.

Crystal Brook, October 15.

PRESENT—Messrs. W. Hamlyn (chair), A. Hamlyn, Hutchison, Townsend, Venning, Miell, Weston, and Symons (Hon. Sec.).

CO-OPERATION.—Mr. W. J. Venning read an interesting account of the successful operation of a farmers' co-operative union at Murtoa, Victoria, and some discussion ensued.

Minlaton, October 15.

PRESENT—Messrs. Newbold (chair), Mayer, Evans, Correll, and A. and J. McKenzie (Hon. Sec.).

PHOSPHATE ROCKS.—Mr. J. D. Mayer gave an interesting address, illustrated by means of the blackboard and with maps, on the composition of phosphates, the supposed source of origin, etc. An interesting discussion followed, and it was resolved to ask that the Branch be supplied with samples of rock phosphates, and that information be published in *The Journal of Agriculture* indicating how samples of supposed phosphate rocks could be tested by members to ascertain whether they were of sufficient value to be worth analysing. After the meeting members were entertained by Mr. and Miss Mayer. [I regret the Department is not in a position to supply samples of phosphate rocks to Branches. The testing of samples of rock for phosphoric acid, even in a rough way, presents difficulties to persons unfamiliar with analytical work. The School of Mines Analyst is, however, furnishing for publication instructions, which, if carefully followed, will give an idea as to whether any sample is worth the cost of a proper analysis.—Ed.]

Clarendon, October 10.

PRESENT—Messrs. Payne (chair), Morphett, P. and J. Piggott, Spencer, Hilton, Dunmill, Harper, Pelling, and Wright (Hon. Sec.), and one visitor.

FALLOWING v. FALLOW CROPPING.—Mr. R. Hilton initiated a discussion on this subject, dealing with the question of growing peas in preference to leaving the land as bare fallow before sowing for the hay crop. Members were of opinion that while sometimes they might get as good a crop after peas as on bare fallow, the crop, as a rule, did better if the land was fallowed and well worked to clean it. In reply to question, members attributed the yellow appearance of the wheat crops in this district to excess of moisture and cold during the winter months.

Calca, October 1.

PRESENT—Messrs. J. J. Roberts (chair), W. J. and E. A. Roberts, Smith, Plush, Crowder, Bowman, and Newbold (Hon. Sec.), and four visitors.

TAKEALL.—Mr. A. B. Smith read a short paper on this subject, and considerable discussion ensued. Members were of opinion that the Branches should combine to ask the Department to make a thorough investigation into the conditions and circumstances under which this disease occurs, with a view to find out the cause, and, if possible, the remedy for the disease. [This has been done several times, but replies have been so confusing that until last year no satisfactory conclusion could be arrived at. If the article on page 297 of December, 1903, issue of *The Journal of Agriculture* is studied, members will note the results of more recent investigation into the cause of takeall.—Ed.]

MIXING WOOD ASHES WITH SUPER.—Discussion on this subject took place, and reply of the General Secretary to query by Pine Forest Branch (July, 1898) was quoted, advising members not to mix wood ashes with super. [Theoretically, the mixing of ashes with super will cause the water-soluble phosphate to revert, or, in other words, to become less soluble. Moisture and time are, however, required to bring about such changes, and there is practically no danger of injury if the manure is kept dry and used within a day or two.—Ed.]

Caltowie, September 20.

PRESENT—Messrs. Royal (chair), Graham, Potter, Neate, Petatz, Kerr, Jettner, McDonald, Hewett, A. and J. McCallum, Moore, and J. G. and F. Lehmann (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Annual Congress, and some discussion ensued.

Port Germein, September 24.

PRESENT—Messrs. Blessing (chair), Deer, Head, Kingcome, Thomas, Gluyas, and Basford (Hon. Sec.).

VETERINARY INSPECTION OF HORSE STOCK AT SHOWS.—Mr. Kingcome read a short paper on this subject at previous meeting. He thought the matter should be taken up by the Council of Agriculture, as it was well known that horses suffering from serious physical defects, not visible to the untrained eye, were often awarded prizes at agricultural shows. Breeders being to a large extent guided by these awards patronised the prize-winning stallions, the natural result being that any defect in the horse was often reproduced in a worse form in the progeny. The judges were not wholly to blame, as often the unsoundness might be of such a character as to be difficult to detect with careful examination by a trained observer. Veterinary examination of breeding stock had been introduced at Wagga Show recently for, he believed, the first time in Australia, and though, as was to be expected, the system came in for considerable criticism from some of the exhibitors, on the whole the results were satisfactory, though surprising to many. This system had been tested with success in Great Britain for some years, and he was certain that in view of the immense harm resulting from the service of unsound stallions the veterinary examination of all horses should be insisted upon by the committees of agricultural societies. He was quite aware that such a proposal would be strongly opposed by many exhibitors, but they had first to consider the interests of the breeders of horses. Most of the members agreed with Mr. Kingcome.

CONGRESS.—Mr. Blessing reported upon proceedings of Congress and on visit to Roseworthy College. Dealing with the question of the standard bushel, he said that it appeared to him that they must leave the matter entirely to the Chamber of Commerce.

Mount Pleasant, October 14.

PRESENT—Messrs. Phillis (chair), Godfree, Thomson, Maxwell, Tabscott, Miller, Giles, and Vigar (Hon. Sec.).

SIZE OF WHEATSACKS.—Members were opposed to proposed reduction in the size of the wheatsack, being of opinion that the four-bushel bag was quite small enough.

ENSILAGE.—Mr. Giles initiated a discussion on this subject. He strongly advised members to put down a large pit of ensilage in good seasons, as if not required at once it would keep for a long time.

DAIRY RECORDS.—Mr. Giles reported on yields from eight different cows during the past three years. The average weights of milk yielded by each cow during that period were respectively:—5,491 lb., 5,551 lb., 4,638 lb., 5,990 lb., 5,923 lb., 5,287 lb., 5,183 lb., 5,226 lb. The highest yield of any cow in any year was 7,003 lb.

Mannum, October 15.

PRESENT—Messrs. Faehrmann (chair), Schulze, Wilhelm, Raum, Schuetze, Haby, Pfeiffer, and Preiss (Hon. Sec.).

IMPACTION.—Some discussion on the subject of dry bible or impaction in cattle took place, deaths having occurred recently in the district. Members wished to know whether it was correct that cattle that were depasturing on saltbush escaped this complaint, as, if so, they thought it would pay to grow saltbush purposely for cattle. [Perhaps some members of other Branches can answer this enquiry.—Ed.]

BINDER v. HARVESTER.—Mr. J. A. Schuetze advocated harvesting with the twine binder in preference to using the complete harvester, as the straw was of considerable value to them. Members generally agreed, but found the threshing work difficult. The header was too slow and laborious, and did not break the straw sufficiently. The Hon. Secretary was instructed to enquire cost of a steam threshing plant.

Forster, October 8.

PRESENT—Messrs. H. Schenscher (chair), E. Schenscher, Pain, Jos., W., F., and John Johns (Hon. Sec.), and two visitors.

BUSINESS.—Mr. Pain reported on proceedings of Congress. Some discussion on the different makes of mowing machines took place. Members wished to know how to prevent a horse striking its front legs with the hind feet. [It is very doubtful whether any treatment will be effective, though some authorities state that in some cases the evil can be lessened by shoeing the horses in a certain way.—Ed.]

Yorketown, October 15.

PRESENT—Messrs. Correll (chair), Bull, Jung, Domaschenz, A. and J. Anderson, Sabine, Latty, Koth, and Newbold (Hon. Sec.), and five visitors, including Mr. W. L. Summers (Inspector of Fertilisers).

CULTIVATION OF SALTY SOILS.—This meeting was held at Mr. C. Domaschenz's residence for the purpose of examining the experimental plots on the salt land referred to at previous meeting. Although the wheat and barley on this land were very irregular, they both promised well prior to the dry spell setting in. In the hollow the wet during the winter had destroyed the plant, while the hot winds had blighted some patches. Saltbushes, mangels, rape, and kale were, however, thriving, and, after discussion of results, it was unanimously resolved that in the opinion of this Branch the experiments carried out by Mr. Domaschenz demonstrated that these salty soils could be very profitably utilised. Mr. Domaschenz was asked to continue his experiments, and several members indicated their intention of undertaking similar tests next season. The visitors were afterwards entertained by Mr. and Mrs. Domaschenz. [A full report on these experiments appears elsewhere.—Ed.]

Koolunga, October 21.

PRESENT—Messrs. Butcher (chair), Button, Shipway, Sandow, Palmer, Cooper, Fuller, Perrin, Burgess, Lawry, and Noack (Hon. Sec.).

BREEDING DRAUGHT HORSES.—Mr. E. Fuller read a short paper on this subject. He advised selecting the best mares for breeding, giving special attention to temper and shape. He preferred the pure draught rather than the progeny of draught mare and blood stallion. The latter were often too spirited, and worked themselves poor. The farmer must of necessity patronise a travelling stallion, as it is very rarely he breeds a sufficient number of stock to warrant his keeping a good stallion. The mares should be well fed while the foals are with them. The foal should be weaned at five to seven months, and should be well fed and given plenty of exercise. The young colt may be broken in at two and a half years old and given a little light work for a time, but should be turned out in a good paddock in the spring. At four years old it will be fit for heavy work. Several members thought a farmer keeping a stallion had a much better chance of getting foals than the one patronising a travelling stallion. Members were generally of opinion that the present system of travelling horses was not satisfactory.

Gladstone, October 1.

PRESENT—Messrs. Goode (chair), Sargent, Goodes, Burton, Odgers, Brayley, and Wornum (Hon. Sec.).

ICE PLANT.—Attention was drawn to the fact that this objectionable weed was growing on the railway reserves near the township. It was decided to endeavour to have the weeds destroyed as early as possible.

CONGRESS.—Delegates reported on proceedings of Annual Congress, and the resolution in favour of removing restrictions on Bureau membership met with approval.

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STOMACH AND BOWEL DISORDERS OF THE HORSE.

By Veterinary Surgeon DESMOND, Government Veterinarian.

In handling such a large subject, and in the first decade of the twentieth century, when science, especially veterinary science, has made such progress, it is necessary to avoid calling every disorder of the horse which arises from affections of the stomach and intestines colic or gripes. In such cases, if a careful examination is made, and the history of the case fully considered, the exact seat of the trouble can be located, and action taken according to the requirements of the case. This would be more rational than the usual method of treating with medicines to deaden the pain, and allowing Nature to remove the cause.

ACUTE INDIGESTION.

We will first deal with acute stomach indigestion, known under the following names:—Impaction of the stomach, stomach staggers, etc.

Causes.—These can be placed under two heads, viz., predisposing and actual. The first (predisposing) are diseases of the organs of digestion, at the teeth, and glands of the mouth, while diseases of the liver may play an important part. One of the most important is disease of the stomach itself. The teeth of most farm horses in this State receive a lot of attention. Whether the operations are performed on scientific lines is an open question. The actual causes are: Over-gorging is the most frequent cause in most cases; rapid feeding, especially when the food is bolted without masticating it properly; errors in dieting; and the water supply. The food which gives rise to these conditions is divided into two heads:—1. Succulent, such as green barley, green clover, green maize, brewers' grains, and growing wheat. Wheat is the worst of all, and I think this applies to both growing wheat and that which is prepared for the mill. 2. Dry, such as seconds, beans, peas, wheat, barley, flour, pollard, maize, wheaten straw, and old grass-hay, such as is given to cattle by the dairy farmers in the winter to fill out their bellies to allow the rain to run off them. Wheat, and some of the green foods, are not only blamed for causing indigestion, but may germinate a ferment; while some observers go so far as to argue that a poison is formed, which gives rise to intoxication, and in this way they account for the peculiar head symptoms seen in some of these cases.

Symptoms.—The symptoms in these cases are not those of well-marked pain. The horse may appear dull and languid, and refuse the most tempting food. As time goes on he begins to show indications of abdominal pain, such as lying down, pawing, yawning, turning up his nose, or, to be more correct, extending his upper lip, and will often extend himself as far as possible—a movement often made by man when attacked by acute indigestion. When lying down the animal rests on his left side, putting his nose back in the region of his stomach on the right side, but not in the flank, as is usually the

case in intestinal troubles or derangements. As time goes on he shows more decided symptoms, colicky pains increase, and, in some cases, pain is shown on pressure over the region of the stomach. If the stomach is distended with gas, also with overloading—and this is nearly always the case when green food has been the cause—the symptoms are most alarming, as in these cases the animal's breathing is more or less laboured, owing to pressure on the diaphragm. (Diaphragm, commonly called the skirt, a membrane dividing the chest and bowel cavities.) The pulse in the early stages is usually full, moderately strong, and slightly increased in frequency; the membranes surrounding the eyes are slightly redder than in health, while the temperature in the early stages is scarcely more than normal.

If the animal does not obtain relief in the early stages all the symptoms are aggravated; the pulse increases and becomes irritable, the breathing more laboured and difficult, the membranes surrounding the eyes become redder, and the temperature may rise. In cases where a large quantity of gas is formed, it can be smelt at the animal's nose, and has that peculiar sour smell well known when the stomach of the horse is opened in *post-mortem* examination while the body is warm. When a quantity of gas accumulates in the stomach we may also get gas in the bowels. In such cases the horse will attempt to vomit, and occasionally succeed, the sour, vomited food passing down the nostrils. This condition, usually a fatal symptom of a ruptured stomach or strangulation of the first parts of the intestines, may give temporary relief. A few cases are recorded where the horse has vomited and recovered; still, the number of cases is so small that the observers have availed themselves of the opportunity to record the cases as something out of the ordinary. If the above symptoms are continued, symptoms of brain troubles set in. These are described as dumb staggers, mad staggers, and stomach staggers. In the dumb form the symptoms are as if the animal was free from pain; there is slight unconsciousness; the head hangs down or is placed in a corner; the pupils of the eye are enlarged; the gait is unsteady when the animal is made to move; the veins are distended, and, if you bleed, the blood is thick and dark in colour. The membranes surrounding the eyes are of a dark blood hue. The animal may die in this stage, or in convulsions. In the mad form we may get delirium; in fact, the animal "runs amuck." The pulse in this form is rapid, full, and strong; bleeding has little effect on it; the blood flows rapidly, which is not the case in the early stages. The respirations are rapid, and the membranes surrounding the eyes of a bright red colour. According to some observers, the blood vessels of the brain in this form are empty, while others argue that the symptoms are due to congestion of the small blood vessels of the brain. When investigating such conditions, great care has to be exercised in making *post-mortem* examinations. The head should be examined first—*i.e.*, before the body is opened—as in opening the trunk first we may drain the blood from the brain, and so alter the conditions. If we first open the thorax (the chest cavity) and abdomen we allow the pressure of the atmosphere to act on the blood vessels of these regions, which may force the blood into the vessels of the brain.

Diagnosis.—In the early stages it is not an easy matter to diagnose gastric derangement, and especially if gases are not present; still, if we get the history of the case, examine the food and the surroundings, we may secure some information to guide us in making a correct diagnosis. In all cases it is very necessary to examine the patient carefully before medicine in any form is given, as neglect in this respect may lead to fatal results. Diagnosis is difficult when the disorder is accompanied by impaction of the bowels or when the bowels are distended with gas. The following is a simple method of examination in such cases, and does not require the use of instruments, except a clinical thermometer. Where the history, food, and surroundings have led one to believe that impaction of the stomach is the trouble:—First, note the appearance of the membranes surrounding the eyes, then the beat and character of the pulse, also the breathing, noting if the abdominal muscles are brought into play, like a broken-winded horse. Take the temperature, which in a healthy horse should be 100.5. The next step is to examine the abdominal cavity. This is accomplished in the following manner:—Over the lower portion of the chest, about fifteen inches behind the shoulder, the ear is placed, with a view of hearing the *borborygmi* (a peculiar sound given off by the natural movement of the bowels) of the first part of the small intestine. If this normal movement does not exist, the next step is to lift the abdomen with both hands, standing on the left (near) side of the animal, immediately behind the breastbone. If impaction of the stomach is present,

and accompanied by pain, the animal will turn its head towards this region. Having examined the gastric region it is necessary to examine the bowels. On the right (off) side, behind the last rib, low down in the flank, the ear is placed. If gas has collected in the bowels, loud and quick movements will be heard. If any of the readers of *The Journal* decide to adopt such a method of examination, it would be as well to remember that "practice makes perfect." It is important that the stockowner should be well acquainted with the sound given off by the movements of the bowels in a horse that is in a perfect state of health. This method requires a lot of practice to master the operation, but, with constant practice, one's fingers seem to have eyes in them.

One must be careful in giving an opinion as to the ultimate results of these cases. An expression of opinion given in the early stages may be regretted later on. It is better to wait some time before giving a decided opinion, and special care is required with pregnant animals. The after effects to be dreaded are founder in the feet, rupture of the stomach, congestion of the lungs, and brain symptoms.

(To be continued.)

SUGGESTIONS TO ENQUIRERS *re* TREATMENT OF STOCK COMPLAINTS.

By VETERINARY SURGEON DESMOND.

In furnishing this series of suggestions as a guide to breeders and owners of stock who wish to obtain advice for their sick or injured animals, it must be borne in mind that circumstances, apparently trivial in character, if clearly stated, may afford valuable information to assist the veterinary in laying down a line of treatment. Information should be given on the following points:—

1. The class or breed of animal; also the age and sex, and date of attack.
2. The general condition of the animal before and at the commencement of the attack.
3. The general conduct of the affected animal, whether constantly standing or frequently lying down, and the different positions assumed when down or standing, and whether there is any peculiarity in the gait when walking, etc.
4. The state of the appetite—whether all kinds of food are refused, or partiality is shown for some particular diet.
5. Ascertain the temperature of the body and extremities; also the internal temperature, by means of a clinical thermometer placed in the rectum, two or three times a day.
6. The state of the bowels as shown by the character of the evacuations, and whether pain or difficulty is experienced in passing them, etc.
7. The character of the urine, and whether it exceeds or is less than the usual quantity.
8. How many times does the animal breathe per minute when at rest?
9. How many beats is the pulse per minute?
10. What is the colour of the membranes surrounding the eyes, and the character of the discharges, if any?
11. State the character of the herbage or other food the animal has been living upon.
12. The nature of the water supply.
13. The character of the locality, whether hilly or flat, heavily timbered, or otherwise, etc.
14. Has the disease existed in the same breed of animals or in the same locality before? Is the complaint prevalent at certain seasons of the year? If so, state when. If a spreading disease, state its limits up to the time of writing.

the attacks of these worms, were noticed; also a number of small, round, white masses filled with eggs. These nematode worms are microscopic in size, and one or other of the different species attacks a large proportion of our cultivated plants. They are usually spoken of as "thread-worms" or "root-galls."

In Europe one species of "root-gall" causes immense damage to the beet crops; others attack clovers, ornamental plants, fruit-trees, and vegetables. Except in the case of attack on sugar beets, results of efforts to combat the pest have not been very satisfactory, though in some cases experiments indicate that a large proportion of the worms may be destroyed in the soil before the crop is sown. With sugar beets it has been found that if seed is sown early, and the plants pulled when four weeks old, and fed to stock, the thread-worms are destroyed before they have matured and laid any eggs, consequently the main crop of beets can then be sown without much risk of loss. In bad cases of infestation, two catch crops, or trap crops, are sown and destroyed before the main crop is planted. As the full life history of the local species of thread-worms has not been satisfactorily determined, it is not possible to say whether any similar treatment would prove effective here; but, in any case, the cost of labour and the value of the crop would be against it. Resource must, therefore, be had to the application of dressings to the ground which will destroy the worms before the crop is sown. Dr. Cobb, of New South Wales, recommends that successive applications of insecticides should be made, as the period occupied by some of the Australian gall-worms may possibly extend over two months. While in the shell the treatment would have no effect; but at other stages good results might be obtained, hence the necessity for long-continued treatment with lighter applications rather than one heavy dressing.

Of the vermicides tested at various times, lime used in large quantities is stated to give the best results. One ton to two tons per acre, applied in two or three dressings over a period of six months, is recommended. Gas-lime in lesser quantities has been used successfully. Sulphate of iron, muriate and sulphate of potash, sulphate of ammonia, and other chemicals, at the rate of 3 cwt. or more per acre, give good results; but the cost of the application, unless its effect is lasting, makes each of these prohibitive for cereal crops under local conditions, as the previous experimental work does not warrant us in expecting any large increase in the crop from the use of these manures.

I hope to be able to arrange with Mr. Arnold, and one or two others, to mark off some of the infested areas on which to try some experiments next year. The treatment will commence after the land is fallowed, and the recommendation of Dr. Cobb, to apply two or three dressings rather than the same quantity of material at one application, will be adopted.

A NEW DISEASE OF FIG BRANCHES.

Mr. T. B. Robson, of Ellythorpe, Hectorville, recently forwarded to the Department of Agriculture some diseased fig branches. He stated that a large number of branches on one of his Capri figs were affected in the following way:—The young wood made during the previous year will put out new leaves and fruit in the spring in the usual way, but before they reach any size they begin to droop, and finally die. The branch also shows signs of disease near the fruits, the bark showing a distinct reddish tinge. Gradually this spreads downwards, until by the end of the season most of the new wood is destroyed, the line of demarkation between the diseased and healthy wood being very distinct. This disease has been noticed on one tree only in Mr. Robson's orchard. This tree has been affected for several years. Specimens of the diseased branches were forwarded to Mr. D. McAlpine, of Melbourne, who advises that he developed from them a luxuriant growth of the grey mould (*Botrytis*), which is undoubtedly the cause of the trouble.

Mr. McAlpine states that last year this disease was reported as prevalent in fig trees in the south-western districts of France. Ordinarily the immature fruits formed in autumn remain on the trees through the winter. These are attacked by the fungus, the fruits become mummified, and bear upon their surfaces the fructification of the *Botrytis*. As the warm weather of spring sets in the spores germinate and spread through the peduncle of the fruit into the young twigs, causing their death. Another method of distribution is

through the softening and falling from the branches of the decaying fruits. These frequently lodge upon other branches, and, remaining there, spread the infection to fresh centres. The removal of all fruit from affected trees at the end of autumn is suggested as a means of preventing the spread of the disease.

Mr. Robson states that the Capri fig attacked by this disease is the only one which has as yet carried winter fruit: up to the present none of the commercial varieties have been attacked. So far there is no evidence of the disease having been combated by spraying. If the main source of infection is, as stated, through the peduncle or stalk of the fruit, it is difficult to see how any fungicide can be effective. If the bark is attacked as a result of outward infection the disease would be much simpler to deal with. To remove the winter figs would, in commercial varieties, involve the loss of the first crop of figs, and, in the Capri fig, remove the fruits which would be required to carry the fig wasp through the winter.

ROSEWORTHY EGG-LAYING COMPETITION.

The following table shows the returns from each pen of birds at Roseworthy for the six months ending November 14; also the eggs laid during November:—

No. of Pen.	Breed.	Owner.	Number of Eggs laid during six months.	Value of Eggs laid during six months.	Number of Eggs laid to Nov. 30.
				£ s. d.	
4	White Leghorn ...	Sunnyhurst Egg Farm	750	2 5 7	816
1	White Leghorn ...	Butler, Mrs. S. ...	640	1 16 4	702
17	Silver Wyandotte	Smith, W. A. E. ...	598	1 17 11	651
9	Buff Leghorn ...	Foot, C. ...	560	1 12 9	618
24	Minorca ...	Penglase Bros. ...	528	1 9 0	599
21	Black Orpington	Tyler, A. H. ...	518	1 6 4	562
31	Ancona ...	Russell, Dr. H. H. E.	481	1 4 7	534
18	Buff Orpington ...	Balfour, J. G. ...	465	1 6 8	499
29	Langshan ...	Hassell, G. ...	459	1 3 9	503
7	Brown Leghorn ...	Marshall, H. P. ...	448	1 1 8	507
19	Buff Orpington ...	Laidlaw, R. ...	445	1 4 0	483
2	White Leghorn ...	Crompton, T. E. ...	423	1 3 5	485
10	Buff Leghorn ...	Sargenfri Poul. Yards	406	0 19 5	452
12	White Wyandotte	Bennett, W. C. ...	370	0 19 3	417
5	White Leghorn ...	Padman, A. H. & J. E.	363	0 17 3	433
20	Black Orpington	Chart Trading Co. ...	363	0 19 1	421
11	Buff Leghorn ...	Yelland, T. E. ...	363	0 16 7	425
22	Black Orpington	Wimble, F. J. ...	359	0 18 0	412
25	Minorca ...	Alfalfa Poultry Yards	353	0 17 11	403
16	Silver Wyandotte	Robson, T. B., & Son	346	0 16 1	376
28	Black Hamburg ...	Fulwood, G. & A. ...	345	0 16 11	381
8	Brown Leghorn ...	Hunter, J., jun. ...	325	0 15 0	379
30	Black Spanish ...	Kluge, J. ...	324	0 16 5	374
27	Silver Campine ...	Smith, J. ...	312	0 15 9	358
26	Silver Campine ...	Hobbs, J. H. ...	308	0 16 2	336
3	White Leghorn ...	Dean, W. S. & E. T.	306	0 13 7	362
6	Brown Leghorn ...	Hammatt, W. D. & L. T.	304	0 13 4	370
15	Golden Wyandotte	Muecke, L. H. ...	278	0 13 11	315
13	White Wyandotte	Pugh, H. M. ...	265	0 12 4	312
14	Golden Wyandotte	Mellor, P. W. ...	225	0 9 10	275
23	Minorca ...	Bower, J. ...	167	0 7 4	193

The average cost of food per bird per week has been 8d., and for the six months 1s. 8½d. The value of the eggs laid has averaged 3s. 7d. per bird, or an average profit in the six months of 1s. 10½d. The method of feeding and general treatment is outlined on pages 93-4 of September, 1904, issue of *The Journal of Agriculture*.

These results compare favourably with those of the Hawkesbury competition, but are a good way behind the Dookie results, as shown in the following recently published details of the number of eggs laid by the first 14 pens in each competition:—

DOOKIE AGRICULTURAL COLLEGE COMPETITION.

	Eggs laid in 6 months.
G. Levens, White Leghorns	765
W. H. Ponton & Sons, Langshans	732
W. J. Hudson, Pile Leghorns	718
A. Fahey, Golden Wyandottes	709
G. M. Commins, Black Orpingtons	701
Mrs. A. A. Wedlich, Black Orpingtons	687
J. A. Hooper, Silver Wyandottes	681
W. T. Lawrence, Brown Leghorns	674
A. Wedlich, Black Orpingtons	663
G. F. Gates, Minorcas	651
R. Kerr, White Leghorns	646
W. F. Evenden, Andalusians	646
Mrs. Corney, Black Orpingtons	631
J. M. Hepburn, Silver Wyandottes	618

HAWKESBURY AGRICULTURAL COLLEGE COMPETITION.

Mrs. Scaysbrook, Black Orpingtons	595
W. H. Peters, Golden Wyandottes	594
G. Howell, Silver Wyandottes	574
Mrs. Hansel (U.S.A.), Brown Leghorns	567
Royal Poultry Farm, Black Orpingtons	521
M. Anderson (U.S.A.), White Leghorns	514
Dr. Martin (U.S.A.), R. I. Reds	509
J. Lowe, White Leghorns	503
Horwood & Dennis, White Wyandottes	502
D. J. Stephens, Silver Wyandottes	500
B. T. Forrest, Black Orpingtons	496
A. J. Byrne, White Leghorns	487
Oceanside Poultry Farm, White Wyandottes	487
F. J. Brierley, White Leghorns	483

POULTRY NOTES.

Written for *The Journal of Agriculture*.

By D. F. LAURIE.

FATTENING.

Within the last year or so a considerable number of people have written asking particulars as to the best methods and the advantages of fattening poultry. Poultry as an article of diet is not nearly as popular in Australia as it should be. It is eminently suited for use during the hot season, when it is both plentiful and cheap, and more palatable than ordinary butchers' meat. It has often occurred to the writer that one of the reasons why so few people include poultry as a regular article of the household menu is that the ordinary 'store' fowl, generally in poor condition and tasteless, is not considered an economical dish, nor is it so generally esteemed. Hardly any other country in the world is so lax as regards the quality of its table poultry as South Australia. It is practically impossible to purchase really prime table birds in proper condition for eating. On an unfatted bird there is a great deal of waste. After serving the legs and wings there is perhaps enough for two others of delicate appetite on the breast, and the balance of even a large bird is tough skin and bones. On a well-fatted bird of the same size a surprising amount of flesh will be found, in positions quite new to those accustomed to the ordinary table bird.

The French poulterers generally exhibit the back of a bird to public view, as the purchasers there know that if that portion of the bird is well clothed with flesh, the breast, etc., will also be in the best condition. It is not only that there is more meat on a fatted bird, but the quality of the flesh is alto-

gether superior in every respect. White-fleshed fowls, unless fat, become dark in colour during the process of cooking, owing to the lack of fat between the tissues, which should aid the cooking process, and render the meat delicate and of good flavour.

The average fowl is rather tasteless, but those who fatten their own poultry will know how superior they are, and how economical. It is a well-known fact that poultry breeders of experience seldom eat poultry other than their own, unless at some brother enthusiast's house. There are several reasons for this, one of which is that they do not care to risk an encounter with a tough, stringy plateful of bones. The householder should, where possible, have some modern fattening coops in a sheltered, quiet nook wherein a sufficiency of birds can be kept. A small space only is required, and the trouble is not very great, but the economy and advantages of having really fine birds with the proper amount and quality of flesh will soon be appreciated.

For export purposes the question is still more important, for, while Australians, as a rule, are content to eat an inferior class of table poultry, no other people will pay very much for that description of bird. If we could ship the birds alive we might get a fair price from the fatteners, but, as we have to kill and freeze, we must send the best quality according to English ideas, or our produce will bring the price of inferior goods only, and that means a dead loss on the transaction. It has been stated that birds shipped to England have not netted sufficient to induce further trade. I know of 1.0 case where really prime birds have been shipped from this State, and until such birds are sent we cannot judge as to prospects. On this point I may at once say that if it pays the Messrs. Brooke, of London, to keep a buyer in Sydney and Melbourne, the prospects of the trade are good enough. At one time Russian poultry was held in poor esteem in the European markets, but during recent years so much attention has been paid to grading and fattening that this brand of poultry now enjoys excellent repute, and high prices result. Here we are, only a few weeks' steaming to South Africa, and yet the Russians supply most of the poultry imported by those people who should be our customers. It is, of course, true that there is better and more frequent communication, but because we lack direct communication we need not despair. The great need here is a fattening establishment, and without doubt there is money to be made in this direction. It is practically impossible for individuals, unless operating on a large scale, to get their birds in the exact condition necessary before shipment. There would be difficulties in grading, and a lot of the birds would be inferior, that is, not up to the standard required. It may be remarked that at present we have very little table poultry to spare. That is true, but we must prepare for the future. An export trade should be opened up, so that when production materially increases, as it will in a year or two, we shall have an outlet at satisfactory prices. Every producer knows what it is to be at the tender mercies of buyers in a well-supplied market. The present price of eggs is enough to make poultry owners think if it is not worth while organising with a view to export. The opening up of an export trade in Sydney raised the local values 30 per cent., and completely checked the tactics of local buyers, among whom "pooling" the markets was not unknown. At the present time breeders are chiefly studying the egg trade and the laying breeds and strains are being multiplied in thousands. This will mean a vast increase in the number of eggs available for export. If we have to depend on the local trade and interstate demands, low prices will result, and many owners will be dissatisfied, but if we open up a proper oversea trade, good prices are assured. The chief difficulty as regards the oversea trade is that regular shipments of sufficient size are not offered. It will be understood that the cost of preparing and shipping a few dozen birds is far greater in proportion than when larger numbers are sent at regular intervals. Until a very good trade is started it would not pay to keep poulterers, and good men are not to be had for casual employment. There is a vast future for the poultry trade, and now that the interest therein is so generally aroused it is high time that the question I have touched upon should be seriously considered. I think the Branches of the Bureau might give this immediate attention, and ascertain what the prospects are in their respective districts in this direction. The information to be gained is the number of breeders and the class of birds, the probable surplus, and the possibilities in the way of combination to fatten and send forward regular supplies of birds for shipment. I believe fattening establishments would soon make their appearance if it could be shown that a regular supply of birds could be depended upon. As regards the best foods

and methods, I dealt with the question a few months ago. It is to impress on breeders the importance of sending only prime birds to market that I am writing now, as the year's "crop" is just beginning.

Ducklings should meet with a ready sale during December. To fatten them properly they should be housed in cool, shady sheds, with plenty of straw, and be well fed. As a rule, the average ducklings sent to market are in poor condition and too old. To pay the owner and to please the purchaser they should be sold, fat as butter, before they reach nine weeks. After that they begin to get the objectionable pin feathers, which detract so much from their value.

GENERAL NOTES.

Keep a supply of small charcoal or wood cinders where the hens can gain easy access to it; also grit and gravel. These almost amount to an insurance premium during the hot weather. The ordinary sow thistle, so much liked by poultry, is easily grown. Buy a load of cow manure, and spread it over some dug ground; water well, and you will have a fine supply during the summer. Rape can be sown at any time, and will give good returns if well watered. A light mulching of short manure will assist matters.

Keep a vigilant eye on vermin. It should be a matter of pride to be able to say that your houses and yards are quite free. A vigorous crusade will soon completely eradicate all vermin and poultry tick. You must, of course, be sure that there are no breeding grounds, and when you clean the houses you should attend to the birds also. The best rule is to confine your birds at night so that they can be easily caught and handled in the morning. Then examine each one, and if vermin (the morning hen lice) are present, a little insect powder may avail. If ticks are seen, have a tin of kerosine and oil—one part kerosine and two parts oil—and a piece of rag or sponge, and apply liberally. I have never known of a failure. Then the houses should be inspected, and if found infested should be liberally sprayed with kerosine and soapsuds as hot as possible. Eight gallons of soapsuds, one gallon kerosine, and a pint of oil (fish for preference), or use whale oil soap, and you have enough to do a dozen ordinary houses. Always avoid loose woodwork, as the pests harbour between such pieces. No vermin can withstand this treatment, and no poultry can be made to pay if infested.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

During the past month full attention has been given to the destruction of weeds and the working down of the land. Owing to illness of the horses the scarifying has been somewhat kept back, but most of the vineyard is free from weeds.

Vines of all varieties have made exceptionally good growth. Favoured by good setting weather the bunches appear to be well filled, and promise another heavy crop at the end of the season. So far as growth is concerned, those vines cut by frost show no ill effects, but off these the crop will be small. As, however, the affected area is comparatively limited, the total yield will not be influenced very much.

The currants were all ringbarked, and have now set a good crop. All the incisions were wrapped in waxed cloth as soon as done, this method having been found the simplest and best way of treating them. Though less than a month has elapsed since the vines were treated, the cinctures already show a large amount of callus. These currant vines, although in poor soil, have grown remarkably well, and show no apparent deterioration on account of the ringing in previous years.

Many of the young trees planted in the orchard last year are now making nice growth. It is remarkable that the pear, which is looked upon as a tree requiring a considerable amount of moisture, is the one which is doing best. Some of them, certainly, are on the best soil we have, but even those on the

lighter and drier soils are growing well, whereas stone fruits adjacent to them have died or are doing indifferently. Citrus trees, which were severely cut by the frost, are recovering. In the middle of the month all trees received a good soaking, and this repeated in a few weeks should give them a good start.

Nursery stock is doing well. A number of varieties of olives were obtained and grafted in September with a fair amount of success, and when ready, these will be used to establish a plantation of named sorts.

DEPARTMENTAL NOTES AND WORK.

Mr. William Angus, B.Sc., the newly appointed Professor of Agriculture, left England by the P. & O. steamer Himalaya on November 12, and is expected to arrive in the State about the middle of December.

Arrangements have been made by which Veterinary Surgeon Desmond will be a regular contributor to *The Journal of Agriculture*. In this issue Mr. Desmond contributes the first of a series of articles on stomach and bowel diseases of the horse, and also extracts from his correspondence on stock complaints. An illustrated article on symptoms and treatment of horses suffering from "red worms," which have caused losses of horses in various parts of the State, is in course of preparation.

During November, besides work of a departmental character, Mr. Quinn has continued his course of work at the Agricultural College at Roseworthy, and completed the course of lectures and demonstrations in fruit culture, conducted for the School of Mines and Industries in Adelaide. He has also, at the request of the owners, visited orchards at Marion, Fulham, Gladstone, and Beetaloo Valley, for the purpose of advising on the treatment of pests and to give demonstrations in the summer treatment of trees. He has expressed great pleasure at the healthy condition of the orchards in the Beetaloo Valley. The peach trees, of early, medium, and late varieties, show a magnificent crop of fruit, while the citrus plantations are in a thriving condition. These orchards supply Port Pirie and the adjoining towns with abundance of fruit of the finest quality.

During the month ending November 26, 9,460 bushels of fruits—all of a tropical nature—446 bushels of vegetables (cucumbers), and 56 packages of plants were admitted to the State, while 456 bushels of bananas were destroyed, and 40 parcels of plants detained owing to not complying with the law regulating the admission of these objects. Within the same period, 6,661 bushels of fruits, of which 4,296 bushels were grown locally, 4,989 packages of vegetables, and 46 parcels of plants were passed for export to the eastern States.

In addition to inspecting butter for export and attending to his duties at Roseworthy College, Mr. P. H. Suter, Dairy Instructor, has, during the past few weeks, visited factories and farms at Lyndoch, Port Pirie, Milang, Jamestown, Yongala, Point McLeay, Port Elliot, and Strathalbyn. A visit was paid to Melbourne for the purpose of purchasing dairy stock for the Agricultural College. Two local studs were also inspected with the same object in view.

Up to November 16, 271 tons 17 cwt. of butter has been exported from South Australia to Europe this season. During the same period last season the total amount exported was only 170 tons 2 cwt., thus showing a considerable increase this year. The quantities of butter coming to hand continue to be about 50 per cent. greater than for the corresponding period last year.

The great development which has taken place of late years in the keeping of sheep on the farm is evidenced by the progress of the exports of frozen lambs. Seven years ago the number shipped was only 3,514 carcasses. The following year the figures rose to 39,525, and since then the totals have been as under:—1899-1900, 91,314 carcasses; 1900-01, 101,719 carcasses; 1901-2, 69,302 carcasses; 1902-3, 104,639 carcasses; 1903-4, 158,806 carcasses. This year promises to show a further marked increase. Up to November 26 about 165,000 carcasses had been shipped, and, though the season is almost closed, the total is expected to reach about 190,000. One steamer this season, viz., the Nairnshire, shipped over 50,000 carcasses.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, November 9, there being present—Col. Rowell, C.B. (chair), Messrs. A. Molineux, G. R. Laffer, A. M. Dawkins, J. Miller, B. Basedow, R. Caldwell, R. Marshall, J. W. Sandford, John Hill, G. F. Cleland, T. E. Yeland, and the Secretary (Mr. W. L. Sumners).

The Hon. Minister advised that a new dairy building was being erected at Roseworthy College, and that the Dairy Instructor would be asked to confer with the Council in respect to the proposal for short courses in dairy instruction for dairymen and farmers.

The Secretary referred to resolution passed at previous meeting giving effect to the resolution of Congress in favour of the removal of limit of membership of Branches, and pointed out that unless some provision was made to prevent it, it was more than likely that the rolls of some of the Branches would be encumbered with names of members who would rarely attend meetings. He suggested, therefore, that with the removal of the limit of membership it should be provided that on June 30 of each year one-third of the members, viz., those who have attended the least number of meetings during the year, should retire. These gentlemen would be eligible for re-nomination if the other members of the Branch desired to retain their services, while at the same time it would afford an opportunity of dispensing with undesirable members. Members generally approved of the proposal, which, it was stated, had been tried successfully in other organisations, and, on the motion of Mr. Sandford, it was resolved to embody the Secretary's suggestion in the rules of membership.

On the motion of Mr. Molineux it was decided to ask the Hon. Minister to forward papers and reports connected with the enquiry into cause of cattle complaint to Veterinary Surgeon Desmond, for enquiry and report.

The Minister forwarded correspondence between Lieut.-Col. Appleton and the Agent-General in reference to the value of certain fodder grasses growing in Somaliland, which the former gentleman spoke very highly of for their resistance to drought and heat and their value for fodder. It was resolved that the Hon. Minister be advised to obtain seed of these plants for trial.

Some reference was made to the fodder plant *Penicillaria spicata*, which was being boomed in the eastern States, and for the seed of which very high prices were charged. The Secretary pointed out that this was nothing but the very old Pearl Millet, a very useful fodder plant, specially for moist sandy lands, but which could be procured in Adelaide at about 1s. 3d. per lb.

The Minister forwarded communication from Queensland Department of Agriculture in reference to request of the Waterside Workers' Union for legislation fixing a standard size for wheatsacks. It was stated that some of the bags handled at Brisbane weighed 370 lb. The members were unanimous that legislation on this matter was not necessary. They could not understand what sort of bag was used in Queensland if it would carry 370 lb. of wheat. The bag used throughout South Australia was the so-called four-bushel bag, which averages about 260 lb. of wheat.

The following gentlemen were approved as members of the Agricultural Bureau:—Messrs. J. E. Freeman and S. G. Wilcott, Calca; Messrs. W. Towill and G. Retallack, Forster; Mr. W. Hutchinson, Koolunga; Mr. H. Billinghurst, Crystal Brook; Mr. J. Forbes, Port Germain; Mr. R. Barritt, Lyndoch; Mr. W. J. Smith, Mount Remarkable; Mr. E. J. Jarrett, Maitland; Messrs. J. Powell and H. H. Illman, Dowlingville; Mr. H. Dempsey, Petersburg;

Messrs. A. E. Hilder and O. Walkington, Wilson; Mr. R. W. Dunstan, Mount Bryan East; Messrs. John Koch and W. R. Stephenson, Arthurton; Mr. M. J. Liddy, Koppio.

Delegates reported on proceedings of Conference at Woodside, and spoke in high terms of appreciation of Veterinary Surgeon Desmond's address on stock complaints.

The Secretary reported that sixty Branches subscribed to the cost of the testimonial presented to Mr. R. Marshall. The committee recommended that the balance in hand, together with any further subscriptions received, be devoted to the purchase of an enlarged photograph of Mr. Marshall. It was unanimously agreed to give effect to this suggestion.

"JOURNAL OF AGRICULTURE."

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The Editor

"Journal of Agriculture,"

Adelaide.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on December 1:—

With the exception of a few hot days, when the thermometer ran up to 99 deg. in the shade, the weather during November has been most pleasant; in fact, ideal conditions prevailed for ripening of the crops: so that harvesting in the North is now in full swing. The quality of the Wheat is admitted to be the finest raised for several years, whilst the yield is quite up to average. Pastoralists are also experiencing a good time, the grazing country just now being in exceptionally good heart. Wool values have also realised a substantial advance, whilst there has been an excellent market for lambs, some 200,000 already having been sold for export.

COMMERCE.—Throughout the month there has been a healthy tone in trade, which was to be expected with such favourable prospects, the country especially sending along large orders, having in view Christmas requirements. In mining circles, the position at Broken Hill continues to improve, shares having advanced, whilst the market in Metals for Silver, Copper, and Lead also shows a decided firming.

BREADSTUFFS.—In consequence of favourable reports from Argentine and lower prices for Wheat in America the value of cargoes has declined, and 32s. 3d. to 32s. 4½d. is now the highest price obtainable for January-February shipments. In the Australian States Wheat is changing hands at about 3s. 3d. per bushel, and here farmers are selling freely for forward delivery, no doubt owing to the crops turning out better than was anticipated. The sample leaves little to be desired, and is far superior to that of last year, 64 lb. per bushel being nothing unusual. The Flour market has been extremely dull, and transactions have been from a hand-to-mouth character. Forage.—There has been practically no export trade put through in Chaff, sales being confined entirely to South Australian consumption, which has been very meagre, as feed is so plentiful. Offal is also easier, and considerable reduction on last quotation has to be taken in order to induce business. Forward contracts for both Bran and Pollard have been made for next year at about 8d. per bushel. In Feeding Grains the new season's Oats are not yet on the market, present prices being only nominal.

POTATOES.—Those raised on the plains near Adelaide (although the yield has been only light) have supplied market requirements, and, as the quality compares favourably with other sorts, met with active month's business. Parcels have also been disposed of to Western Australia. Values fluctuated slightly, but at time of writing rates are decidedly firmer. Onions.—Those offering at moment are not sufficiently hardy for transport purposes, therefore had to find local quitance, result quotations since our former show a weakening.

DAIRY PRODUCE.—The genial weather of November left very little to be desired for the better marketing of Dairy Produce. Quantities of Butters showing a substantial increase and comparing well with former month, but as a good demand has existed for all fresh in prints, prices have well sustained, especially as packers for export operated freely for all surplus lots, thus keeping rooms well cleared. Buyers of bulk for Britain have also been purchasing heavily, the exports already exceeding last year's shipments. Eggs.—Prices fluctuated in sympathy with the lowering in the eastern States, but during the last few days a healthier tone set in, and a recovery was established; this owing to Western Australia buying largely for Christmas wants. Cheese.—New make has now entire control, and good trade has been put through, but factories are rather inclined to push deliveries; result, rates are weaker. Bacon.—Business in this line has not opened any too satisfactorily, owing to the gradual running down in quotations for factory sides, whilst curers' stocks were secured when the tone of the market was decidedly better. Holders, however, are hopeful that with nearer approach of the holidays an improvement will be realised. Hams have met with very fair sale, parcels being secured in view of the increased demand expected. Honey.—The new season's take, which is reckoned to be very heavy, is just coming in, but values have opened out unusually low. Almonds have been in fair request at about former quotations.

LIVE POULTRY.—Farmers knowing the strong demand that is experienced during Christmas festivities are disposed to hold back their birds for these

sales, but this is scarcely wise, as poulterers and restaurants endeavour to secure requirements prior to the holiday weeks. The prices obtained for all lines of poultry throughout November have been exceptionally satisfactory.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, $3\frac{1}{2}$ to $3\frac{1}{2}\frac{1}{2}$ per bushel of 60 lb.

FLOUR.—City brands, £8; country, £7/10/.

BRAN, $7\frac{1}{2}$ d. to $7\frac{3}{4}$ d.: POLLARD, 8d. to $8\frac{1}{2}$ d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, $1\frac{1}{5}\frac{1}{2}$ to $1\frac{1}{6}\frac{1}{2}$: White Champions, nominal, $2\frac{1}{4}$ to $2\frac{1}{8}$.

BARLEY.—Cape, $1\frac{1}{8}$ to $1\frac{1}{10}$ per bushel.

CHAFF.—£2/15/- per ton of 2,240 lb., f.o.b. Port Adelaide.

POTATOES.—New locals, £7 to £7/5/- per ton of 2,240 lb.

ONIONS.—New locals, £3/10/- per ton of 2,240 lb.

BUTTER.—Factory and creamery fresh, in prints, $8\frac{1}{2}$ d. to $9\frac{1}{2}$ d. per lb.; best separators and choice dairies, $7\frac{1}{2}$ d. to $8\frac{1}{2}$ d.; store and collectors' lines, $5\frac{1}{2}$ d. to $6\frac{1}{2}$ d.

CHEESE.—Prime new make, 5d. to $5\frac{1}{2}$ d.; lower grades, $4\frac{1}{2}$ d. to 5d.

BACON.—Factory-cured sides, $5\frac{1}{2}$ d. to $6\frac{1}{2}$ d.; farm flitches, 5d. to $5\frac{1}{2}$ d. per lb.

HAMS.—S.A. factory, 8d. to 9d. per lb.

EGGS.—Loose, 6d. per dozen.

LARD.—In bladders, $4\frac{3}{4}$ d.; tins, $4\frac{1}{2}$ d. per lb.

HONEY.— $2\frac{1}{4}$ d. for prime clear extracted new season's in 60-lb. tins; Beeswax, $1\frac{1}{2}$ per lb.

ALMONDS.—Softshells, 4d.; kernels, $8\frac{3}{4}$ d. per lb.

LIVE POULTRY.—Heavy-weight table roosters realised 2/- to 2/6 each: plump hens and good conditioned cockerels, $1\frac{1}{4}$ to $1\frac{1}{10}$; poor and light, $1\frac{1}{2}$ to $1\frac{1}{2}$; ducks, $1\frac{1}{7}$ to $2\frac{1}{6}$; geese, 3/- to 4/; pigeons, 6d. to 7d.; turkeys, $5\frac{1}{2}$ d. to 7d. per lb., live weight, for fattening to fair table sorts.

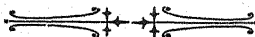
Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.



MONTHLY RAINFALL.

The following table shows the rainfall for the month of November, 1904:—

Adelaide ...	0 65	Manoora ...	0 47	Echunga ...	1 20
Hawker ...	0 27	Hoyleton ...	0 43	Macclesfield ...	1 29
Cradock ...	0 23	Balaklava ...	0 65	Meadows ...	2 11
Wilson ...	0 31	Port Wakefield ...	0 39	Strathalbyn ...	1 05
Gordon ...	0 22	Saddleworth ...	0 49	Callington ...	0 52
Quorn ...	0 67	Marrabel ...	0 45	Langhorne's Bridge ...	0 51
Port Augusta ...	0 24	Riverton ...	0 69	Milang ...	0 49
Port Germein ...	0 18	Tarlee ...	0 94	Wallaroo ...	0 08
Port Pirie ...	0 26	Stockport ...	0 55	Kadina ...	0 34
Crystal Brook ...	0 42	Hamley Bridge ...	0 43	Moonta ...	0 19
Port Broughton ...	0 58	Kapunda ...	0 85	Green's Plains ...	0 36
Bute ...	0 54	Freeling ...	0 83	Maitland ...	0 66
Hammond ...	0 32	Stockwell ...	0 87	Ardrossan ...	0 56
Bruce ...	0 28	Nuriootpa ...	1 02	Port Victoria ...	1 04
Wilmington ...	0 56	Angaston ...	1 13	Curramulka ...	0 71
Melrose ...	0 38	Tanunda ...	1 18	Minlaton ...	0 37
Booleroo Centre ...	0 17	Lyndoch ...	0 87	Stansbury ...	0 27
Wirrabara ...	0 65	Mallala ...	0 51	Warooka ...	0 25
Appila ...	0 45	Roseworthy ...	1 09	Yorketown ...	0 15
Laura ...	0 68	Gawler ...	0 84	Edithburg ...	0 10
Caltowie ...	0 30	Smithfield ...	0 85	Fowler's Bay ...	0 27
Jamestown ...	0 39	Two Wells ...	0 52	Streaky Bay ...	0 25
Gladstone ...	0 45	Virginia ...	0 59	Port Elliston ...	0 12
Georgetown ...	0 39	Salisbury ...	0 60	Port Lincoln ...	0 13
Narridy ...	0 37	Tea Tree Gully ...	0 75	Cowell ...	0 03
Redhill ...	0 42	Magill ...	0 84	Queenscliffe ...	0 41
Koolunga ...	0 48	Mitcham ...	0 86	Port Elliot ...	0 55
Carrieton ...	0 20	Crafers ...	1 55	Goolwa ...	0 42
Eurelia ...	0 27	Clarendon ...	1 60	Meningie ...	0 64
Johnsburg ...	0 20	Morphett Vale ...	1 10	Kingston ...	0 85
Orroroo ...	0 27	Noarlunga ...	0 47	Robe ...	1 14
Black Rock ...	0 19	Willunga ...	1 05	Beachport ...	1 00
Petersburg ...	0 20	Aldinga ...	0 48	Coonalpyn ...	—
Yongala ...	0 42	Normanville ...	0 29	Bordertown ...	1 14
Terowie ...	0 21	Yankalilla ...	0 57	Frances ...	1 12
Yarcowie ...	0 23	Eudunda ...	0 42	Naracoorte ...	1 02
Hallett ...	0 28	Truro ...	0 72	Lucindale ...	0 87
Mt. Bryan ...	0 34	Palmer ...	0 60	Penola ...	1 03
Burra ...	0 45	Mount Pleasant ...	1 16	Millicent ...	1 05
Snowtown ...	0 58	Blumberg ...	0 88	Mount Gambier ...	1 96
Brinkworth ...	0 33	Gumeracha ...	0 98	Wellington ...	0 63
Blyth ...	0 30	Lobethal ...	1 23	Murray Bridge ...	0 33
Clare ...	0 70	Woodside ...	1 07	Morgan ...	0 03
Mintaro Central ...	0 72	Hahndorf ...	1 23	Overland Corner ...	0 23
Watervale ...	0 66	Nairne ...	0 94	Renmark ...	0 15
Auburn ...	0 65	Mount Barker ...	1 10		



AGRICULTURAL BUREAU REPORTS.

Petina Well, October 15.

PRESENT—Messrs. W. Penna (chair), R. and A. Penna, Norton, and Fiddaman (Hon. Sec.).

SHED BUILDING.—Mr. E. Fiddaman read a short paper on this subject. It would pay every farmer to build good sheds on his homestead, as those who erect flimsy sheds were always repairing them. The shed should be made as strong as possible, without too much weight in the shape of timber on top, or the forks are likely to split when the straw gets wet. The forks should be trimmed out, so that the rails rest on the bottom of the fork, and not pinch halfway down. In fixing the rails on top he found it a good plan to bore a hole in the end of each, and fasten them together with wire on to the ridge pole, instead of fixing them permanently. By doing this the ridge pole and wall plate carry about the same amount of pressure. Where the farmer can manage it, he would advise iron roofs, especially for the machinery and wheat sheds, and a 10,000-gallon tank alongside to catch the water. For the sides of the shed pine slabs or mallee rails will be found more serviceable than brush, and less likely to catch fire.

FEEDING HORSES.—Some discussion on this subject took place. One member advocated a large feeding box or trough built of stone, so that all the stock could feed at the same time. Other members advised a separate feed box for each horse, so that each got its proper share, some being much more rapid feeders than others. All horses stabled should be kept in separate stalls to avoid risk of injury by kicking, etc.

Wilson, October 22.

PRESENT—Messrs. Morrison (chair), Nelson, Sexton, Meyer, Logan, and Neal (Hon. Sec.).

MEMBERSHIP.—Members were of opinion that the rule in regard to non-attendance of members should be enforced.

RABBIT DESTRUCTION.—Mr. Sexton stated that he had tried fumigation by burning sulphur in the burrows, but owing to the rabbits outside opening some of the entrances the treatment was not effective. Mr. Hilder found phosphorised pollard effective, and was satisfied that if simultaneous action was taken throughout the district they could soon reduce the rabbits to a minimum. Members were agreed on this point, and it was decided that each member should try to induce his neighbours to take action to destroy the rabbits. It was also resolved that the District Council be asked to enforce the destruction of rabbits by all landholders.

Narridy, October 22.

PRESENT—Messrs. Satchell (chair), Turner, Hodges, Freebairn, Kelly, Smart, and Darley, and five visitors.

STANDARD SAMPLE OF WHEAT.—The Chairman reported on proceedings of Congress, and dealt particularly with discussion on standard sample. Mr. Turner could see no reason why they should not have two or more standards, the same as in America. It was, however, a mistake to say now that South Australian wheat was the best in the world, as Canadian flour had sold at 30s. per ton more than the local article. Members thought this due to special circumstances rather than to any superiority of the flour.

POULTRY.—Mr. H. Turner read a paper on this subject, and tabled a fine Wyandotte cockerel, sixteen weeks old, weighing 5½ lb. He said that in-breeding did not necessarily cause depreciation; it was indiscriminate in-breeding of weak and sickly birds that did the damage. He stated that he could not raise a fowl to four months for less than 1s. 8d. For breeding purposes the farmer should pen up a vigorous rooster with ten or twelve of the best of his hens, and not keep any other roosters at all. He preferred the incubator for hatching chicks.

Davenport, October 27.

PRESENT—Messrs. Trembath (chair), Holdsworth, Roberts, Hodshon, and Lecky (Hon. Sec.).

BINDING DRIFTING SAND.—Mr. J. Holdsworth read a paper describing the efforts of the local Corporation to deal with the drift sands. About twenty years ago the Corporation planted all the vacant land and sand ridges with couch grass, the result being most satisfactory, the grass binding the sand and withstanding the ordinary seasons of drought most successfully. The continued drought of from 1893 to 1901 caused the grass which was growing on the sand ridges most exposed to the southerly and northerly winds to perish, the result being that several very large hills became loosened and began to drift. In the hollows and less exposed positions of the park lands and vacant allotments the grass managed to live, the rains of 1902 and 1903 restoring many of these patches. The failure of the couch grass in exposed situations to stand an extended drought of years caused the local authorities to try other grasses which were highly recommended as drought-resisting and sand-binding agents. The first tried was the famous marram grass, roots of which were obtained from Port Fairy in good order, and when planted were well watered when placed in the sandhill. This grass only grew in one isolated patch, where there had been a large amount of water on it. It has lived and is still living. It has not started out or made any practical headway during the two years, although the plants, numbering about 200, are healthy looking. The plant is growing best nearest the sea end of the hill, and from experience it appears that the marram is not a success on drift sandhills lying inland from the coast, luxuriating in sea sand and on the sand dunes and ridges along the sea beaches. The experiment cost the local Council £26. When it was seen that the marram did not grow, the whole of the hill was laid down in couch grass and watered, the hill to-day being nicely carpeted with a vigorous mat of couch. The second experiment, with seed of American dune grass, was a failure, the seed not germinating. Lupins were tried, but without any results, the seed also not germinating in the dry sandhills around the port. The best results obtained have been by planting couch grass, and then in the most exposed portions laying down a covering of manure over the places where the drift is worst. If all the sandhills and bare places could be covered with manure (which, strangely enough, withstands the strongest wind, and thus holds the ground), and then planted with couch grass, the problem of holding drift sandhills will be solved. Another advantage the manure has also is that it assists the native plants to grow. In many places where manure has been laid down quite a crop of native plants, and in a few cases shrubs, have come up. The best time to plant is stated to be the spring. He had planted it after a rain in every month of the year, and it had grown. In the winter it is dormant to a large extent, but if dug up and planted in the sand it grows right away. A discussion ensued, in which the consensus of opinion favoured the planting of couch grass as the best and most effective binding agent for this district, with its peculiar local conditions.

Onetree Hill, October 20.

PRESENT—Messrs. Bowman (chair), Blackham, Blake, Cowan, Flower, Ifould, Smith, and Clucas (Hon. Sec.), and one visitor.

ANNUAL REPORT.—Thirteen meetings held, with average attendance of nine members. Officers thanked and re-elected.

WHEATS FOR DISTRICT.—In reply to questions, Mr. Blake gave Marshall's No. 3 premier position for this district as an all-round wheat. Majestic was a very good hay wheat, and Baroota Wonder deserved special mention as a good wheat to resist rough weather.

TIMBER FOR TROLLEY.—Mr. Blake advised stringy bark as most suitable for the frame, spruce for the bottom, boxwood for naves, and ironbark for spokes. Colonial-made wheels were superior to imported, and he considered the nut axle easier running than the patent. Bluegum was, perhaps, the best all-round timber.

Millicent, October 6.

PRESENT—Messrs. McRostie (chair), Varcoe, Stewart, Lindsay, Boneham, Mutton, Oberlander, Major, Harris, Davidson, and Campbell (Hon. Sec.), and one visitor.

BUSINESS.—Delegates reported on proceedings of Annual Congress, and some discussion took place in connection with the standard bushel and grading of wheat. Mr. Davidson read some extracts from a book on "America at Work," dealing with the labour-saving appliances and methods of working in a large canning factory. Mr. Varcoe showed model of hingeless slide gate, with roller for gate to slide on. Mr. Crouch called attention to the persistent rise of late years of freight rates on wool shipped to Melbourne. The Hon. Secretary thought this rested in the hands of the woolgrowers, who could, by combining, prevent others from charging too highly for services.

CO-OPERATION.—The Hon. Secretary gave an account of the operations of the Eudunda Co-operative Society, which was formed seven years ago to dispose of wood, etc., and to buy necessities for its members. Four general stores were run by the Society, and goods were paid for in cash, the profits being returned in the shape of bonuses on purchases. During the previous year the Society purchased over 8,000 tons of firewood from its members, and showed a credit balance of £700 after writing off £200 on previous losses on the wood account. The capital of the Society was now £5,212, and the reserve fund £538. Its operations were carried on in some of the worst of the drought-stricken areas on the Murray Flats.

Golden Grove, October 13.

PRESENT—Messrs. Angove (chair), Milne, Maughan, Ross, Rawlings, Haines, McPharlin, Harper, White, Mullett, N. J. and A. D. N. Robertson (Hon. Sec.).

APPLE EXPORT.—Mr. M. Maughan read a paper on this subject. After last year's experience almost every grower is convinced of the necessity for combination to secure the proper disposal of his fruit in London. Through the increased area coming into bearing, and also to the splendid results obtained by spraying with arsenic for the suppression of codlin moth, the production of marketable fruit would be largely increased in the course of a few years, hence the necessity for conserving present markets, securing fresh outlets, and reduction in the cost of marketing. While it was generally admitted that South Australia produced apples equal to, if not better than, her competitors, and it had been proved that there was a large opening for their fruit in Europe, there was no mistaking the fact that the industry was passing through the severest crisis yet experienced. Take first the cost of sending a case of apples from his garden to London:—

	s.	d.
Cost of case in the garden	...	0 11½
Wrapping paper and wood wool	...	0 2½
Sorting, packing, and branding	...	0 5
Carriage to Port Adelaide	...	0 3
Port charges and wharfage	...	0 3
Freight and lighterage to steamer	...	3 8
Insurance	...	0 1
London charges	...	1 0
Total	...	6 10

While they could not grow apples at less than 2s. 6d. a case they must realise at least 9s. 6d. in London to cover expenses. This high price limits the markets, and reduction in expenses was imperative. Freight charges particularly were excessive, and, besides, the companies accepted no responsibility for the safe carriage of the fruit. The growers in the different States had been considering this question, and had decided that the shipping companies should be requested to accept the responsibility for carrying the fruit at a temperature of not less than 34 deg. Fahr. or more than 38 deg. Fahr., to place self-registering thermometers in each hold, and to be responsible for ullage. If this is done

it will greatly improve the conditions under which their fruit was exported. He thought more attention should be paid to the varieties exported. He believed they should stick to Cleopatra, Dunn's Seedling, Jonathan, and Rome Beauty, and not send the many sorts, some quite unsuitable, which had been exported in previous years. Notwithstanding last season's results he had strong faith in the apple industry, as the extensive markets in England, Europe, South Africa, and India would in time take very large quantities of fruit. Some of the members doubted whether it would pay to grow apples for export at only 2s. 6d. per case, as those not fit for shipping would fetch less. Mr. Harper said 2s. 6d. per case all round would pay, but not for those only fit for export.

Nantawarra, October 17.

PRESENT—Messrs. R. Nicholls (chair), Dixon, Herbert, Rattew, Dall, and J. Nicholls (Hon. Sec.), and one visitor.

POULTRY.—Paper in September issue of *The Journal of Agriculture*, by Mr. J. von Bertouch, was read and discussed. Members were of opinion that the poultry industry was worthy of more attention than it received on most farms.

EARLY FEED FOR SHEEP.—Mr. Dixon reported that the 60 acres he sowed with barley, oats, kale, and rape for his sheep had, owing to unfavourable conditions, proved a failure. Members reported that wild mustard was very plentiful this year; in fact, the crops were much dirtier than usual. In view of this and the relative returns from lambs and wheat, the Chairman expressed the opinion that many of the crops would have given a greater monetary return if they had been fed off by sheep.

STOOKING HAY.—Members would like the opinions of other Branches on the best method of stooking hay.

Waikerie, October 15.

PRESENT—Messrs. Rowe (chair) Perry, Jaeschke, Burrows, Pickering, Starr, Rogers, Woods, A Lewis, sen., A. Lewis, jun., and Green (Hon. Sec.), and four visitors.

DRYING FRUIT.—Mr. W. J. Woods read a paper on drying apricots and peaches. He used a sulphur box 7 ft. by 3 ft. 6 in. by 4 ft. high, made of 3 by 2 timber, and covered with American duck. This box holds 60 trays of fruit. For apricots he used 1½ lb. of sulphur, and for peaches 2 lb. of sulphur, to the box of trays. The fruit must be ripe; unripe fruit dries dark and unsightly. Do not pick more fruit than can be cut and sulphured the same day. Cut the fruit as even as possible. The drying ground should be a lucerne patch. Three or four good hot days will dry the fruit sufficiently. Grade the fruit from the trays; it will save a lot of labour later on.

Mundoora, October 24.

PRESENT—Messrs. Harris (chair); Shearer, Mildren, Dick, Mitchell, Blake, Aitchison, and Gardiner (Hon. Sec.), and one visitor.

STEAM THRESHING PLANT.—Discussion took place on correspondence concerning cost, etc., of steam threshing plant, but members were undecided as to whether it would pay to cut portion of the crop with the binder and use a steam thresher for securing the grain.

STANDARD SAMPLE OF WHEAT.—This subject was again discussed, but nothing fresh elicited. Mr. Kahlbaum's paper on the milling qualities of wheats was also discussed. Members pointed out that owing to the danger from red rust it was necessary to grow a considerable proportion of rust-resistant wheats, and that milling qualities alone could not be studied.

Meadows, October 31.

PRESENT—Messrs. Ellis (chair), Clatworthy, Usher, Wright, Nicolle, Griggs, W. J. and C. E. H. Stone (Hon. Sec.).

WATTLE BARK V. MALLET BARK.—Some discussion took place on the probable effect on local price for wattle bark of the competition with mallet bark from Western Australia. Members doubted whether the local trade would be affected to any extent.

STOCK COMPLAINTS.—Considerable discussion took place on the treatment of common ailments of stock.

FRUITGROWERS' ASSOCIATION.—Mr. G. T. Griggs referred to matters connected with the export of fruit to oversea markets, and advised growers to join the Fruitgrowers' Association.

Longwood, October 29.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Oinn, Antuar, Smith, Vogel, Cheeseman, McGavisk, and Hughes (Hon. Sec.), and eight visitors.

ARSENITE OF LIME AND BORDEAUX MIXTURE.—The Hon. Secretary called attention to error in report of previous meeting which conveyed the impression that Mr. Petersen, of Upper Sturt, used this mixture successfully, whereas he is strongly opposed to applying the two solutions together, being convinced that the mixture burns the tender foliage. Some talk about spraying ensued, and several of those present stated that they were trying the effect of spraying for codlin moth. One visitor stated that he noticed more woolly aphids on his trees since he had been spraying with arsenic, and he thought this due to the poison having destroyed the ladybirds. Mr. Oinn showed live codlin moths not artificially hatched. [In reply to enquiry, Mr. Charles French, F.L.S., Government Entomologist, says:—"I do not think the spray would kill the ladybirds, but it may have caused them to quit." It is not at all likely that the ladybirds would be poisoned, though the mixture might destroy the soft-bodied larvæ.—ED.]

GENERAL BUSINESS.—Samples of Italian crimson clover were shown. This fodder plant is being more largely grown each year in this locality. Two members stated that they were experimenting in ring-barking fruit trees to cause them to fruit.

KILLING YACCA.—Mr. Oinn reported that he boiled 4 oz. each of soda and arsenic in $1\frac{1}{2}$ pints of water for a quarter of an hour, and then put about a tablespoonful of the solution into the heart of a number of yaccas or grass trees. In about a month all the yaccas were dead.

Stansbury, October 1.

PRESENT—Messrs. Humphreys (chair), Faulkner, Anderson, Pitt, Jones, and Cornish (Hon. Sec.), and one visitor.

SALTBUSH.—Mr. P. Anderson tabled fine samples of saltbush, and stated that from seed sown two or three years ago he had a number of plants, some of which were 8 ft. to 10 ft. in height. Last season the sheep ate the bushes, as far as they could reach, and this year his Angora goats had been grazing on the saltbush. Mr. Anderson stated that he was convinced that Angora goats would do well in this locality.

LUCERNE.—Some discussion on this subject took place, and although lucerne is not grown to any extent in the district, a number of residents are of opinion that it will do well on the sandy soils once established; but the difficulty was to secure a good stand. Mr. Anderson stated that he had failed to get a good stand of lucerne at Mitcham, though the land was thoroughly prepared, and seed sown fairly thickly.

HORSE COMPLAINTS.—Many of the members take exception to Veterinary Surgeon Desmond's diagnosis of cause of recent losses of horses on the Peninsula. They point out that very many horses are suffering from these worms, yet the five animals that died were all on one farm. They thought that death was caused by something local to this farm.

Calca, October 22.

PRESENT—Messrs. Plush (chair), Bowman, Wilcott, Roberts, Freeman, and Newbold (Hon. Sec.), and two visitors.

HOMEMADE SUPERPHOSPHATE.—Mr. A. Plush read an extract from a newspaper describing how to make superphosphate from bones. He thought the method was too expensive. [It is very rarely that a farmer can make a satisfactory manure by treating the bones with sulphuric acid. If situated anywhere near a railway line it will pay better to exchange the bones for manure with one of the local manufacturers.—Ed.]

ORANGE SCALE.—Mr. Freeman reported an insect attacking his orange trees, the leaves of which were quite black. [Spray the trees with resin wash or kerosine emulsion. See that the trees are not suffering from want of moisture before spraying.—Ed.]

Clare, October 21.

PRESENT—Messrs. Birks (chair), Kelly, Christison, Carter, Jarman, Dall, Knappstein, and Greenway (Hon. Sec.), and several visitors.

PIG-BREEDING.—Mr. J. Dall read a paper on this subject. Pig-breeding might be made more profitable to the farmer than it was. In a district like this, with a good rainfall, the farmer could grow suitable feed for the pigs; in fact, this was one of the essentials to success. For bacon pigs he advocated mating crossbred Berkshire-Poland-China sows to a Berkshire boar. For porkers he would mate an Essex boar to a Yorkshire-Essex sow. The black breeds he found much harder than the whites. The breeder should pay great attention to the selection of the boar. He favoured raising cross-breeds because they grow faster and mature earlier as a rule than the purebred animals. He did not consider there was much profit to be made out of pigs where they must be fed in the sty; most of their food must be obtained in the field. Early in the autumn, barley, rye, or rape should be sown to provide grazing for them. Wean the young pigs at six weeks, and feed them liberally in a sty for about three weeks, then turn them out in the paddock until they are well grown. A month's liberal feeding then in a small yard will make them fat and in prime condition. Peas, wheat, and barley were, perhaps, the best feeds, and he would give pollard and water to drink. Wheat does best when it is soaked for two or three days before feeding to the pigs. Peas were probably the most profitable feed for them to grow, as they benefited the land for cereals. A good shelter, a supply of clean water, and plenty of straw bedding should be provided for the pigs. The water was none the worse if slightly brackish. Some discussion followed, members agreeing that pig-breeding in some measure was profitable, but the great variation in prices from season to season was against it as a permanent industry. Mr. Knappstein stated that where waste green fruit was to be fed to pigs it should be boiled and a little pollard added. Mr. Jarman stated that at Roseworthy College they found pigs gained weight quicker on peas than on wheat or slops. Mr. Birks said where wheat heads were fed to pigs it was not necessary to soak them first.

Inkerman, October 25.

PRESENT—Messrs. Kennedy (chair), Sampson, Smith, Mugford, Williams, and Smart (Hon. Sec.), and two visitors.

POULTRY.—Mr. Williams read a paper on this subject. He was satisfied, after several years' experience, that poultry could be made very profitable on the farm. He advised buying sittings of one or other of the proved laying breeds. Personally he preferred Silver Wyandottes, but the Leghorns, Hamburg, or Minorca would all lay well. He would adhere to the purebred birds, and avoid inbreeding. The best pullets should be kept for breeding, and mated with an unrelated cockerel. The hens should not be kept for more than three seasons at the outside, and he suggested punching small holes in the feet for the purpose of indicating the age of the birds. Some discussion followed, and the suggestion for telling the age of the birds was favourably commented on.

Utera Plains, October 22.

PRESENT—Messrs. Hornhardt (chair), J. Deer, sen. and jun., Barrett, Hale, R. J. and H. West, A. R. S. and A. R. Ramsey (Hon. Sec.), five hon. members, and two visitors.

SHEEP ON THE FARM.—Mr. J. Deer, jun., read a short paper on this subject. Every farmer should keep a few sheep, even in this district, where, owing to absence of permanent water and distance from market, they were seriously handicapped. Here they would have to depend upon wool for their profits, and they should, therefore, go in for Merino sheep. A good ram should be secured. In this locality they must avoid having the lambs dropped too early, and he would, therefore, put the rams with the flock in December.

QUESTION BOX.—Several questions were asked through this medium, and some discussion ensued. Generally members favoured a reasonably high standard for wheat. The destruction of rabbits on Crown lands gave rise to some discussion, but no decision was arrived at. It was generally agreed that the rainfall records of Cowell did not fairly represent the Franklin Harbour district, the average being over that of Cowell. Members thought travelling agents a benefit to the district.

Port Pirie, October 22.

PRESENT—Messrs. Wright (chair), Johns, Crispin, Spain, Humphris, Teague, and Wilson (Hon. Sec.).

BUSINESS.—Paper read at previous meeting by Mr. Humphris (page 195, October issue) was discussed. In view of the more lasting nature of the effects of bonedust members were disposed to regard it as superior to superphosphate. Members did not consider the analysis of a soil as a reliable guide to the farmer in manuring his land. It was considered better to plough under a green crop than to manure with stable manure. All manures should be thoroughly pulverised prior to use. Super should be sifted.

JOURNAL CRITICISMS.—Articles in October issue of *The Journal of Agriculture* were criticised by different members. Mr. Kahlbaum's paper on wheat was favourably noticed. Comeback, John Brown, Gluyas, and Carmichael's Eclipse wheats were tabled. The members were pleased with the appearance of Comeback; red rust was noticed on John Brown. Koolunga paper on fallowing was generally agreed with. Dry working of fallow was considered a mistake. One member stated that he had fallowed in a heavy crop of stubble, and afterward cross-worked the land with a disc cultivator to break up the straw. The very meagre nature of many Bureau reports was commented on, and members deprecated the absence of any points of interest therein. Mr. Venning's paper on the "Agency Nuisance" was generally agreed with. Members did not consider it advisable to soak bacon, as recommended in Angaston report.

WEIGHT OF BINDER TWINE.—Attention was again directed to the short weight in bundles of binder twine. Members were of opinion that manufacturers should allow for shrinkage in weights.

Richman's Creek, October 24.

PRESENT—Messrs. Knaüerhase (chair), Lehmann, Roberts, Wright, J. and J. S. McSkimming, Donovan, Knox, Nicholson, and Kelly (Hon. Sec.), and four visitors.

STANDARD BUSHEL.—Mr. F. H. Lehmann read a paper in which he claimed that a high standard, say 65 lb., would not benefit the farmer. Members were generally agreed that a more satisfactory way of disposing of their wheat was necessary. Mr. Lehmann thought they should support the system of selling by auction, as the wheat would then realise prices according to its quality. Some members thought that the Farmers' Co-operative Union should be better supported, and instanced cases where the Union had been the cause of the price in country districts being maintained. It was agreed that the standard should be fixed earlier in the season than was done last year.

Dowlingville, October 21.

PRESENT—Messrs. Mason (chair), Montgomery, Foggo, Grave, and Lock (Hon. Sec.), and two visitors.

STOCK COMPLAINTS.—Discussion took place on losses of stock, particularly cattle, throughout the district of late years. Fat cattle are taken ill suddenly, and die within a day or two; in some the omasum is impacted, but in others it is quite soft. Milking cows suffer most. The Chairman thought the Stock Department might give more attention to this matter, and when not specially engaged in attending to diseased stock the Inspectors might lecture on the treatment of stock, and also endeavour to find out cause of so many animals dying.

Saddleworth, October 21.

PRESENT—Messrs. Bee (chair), Frost, Baldwin, Klau, Leeder, Hannaford, Plant, Scales, and Coleman (Hon. Sec.), and seven visitors.

STANDARD BUSHEL.—Attention was called to error in September issue of *The Journal of Agriculture* in connection with discussion on this subject. The resolution carried was that wheat under standard should be docked pound for pound in weight for each pound under standard; in other words, that the farmer should give 1 lb. per bushel extra weight for each and every pound that his wheat weighs under the f.a.q. standard.

HOMESTEAD MEETING.—This meeting was held at Mr. F. Plant's farm. The crops, machinery, and outbuildings were all inspected with interest. Notwithstanding the dry weather, the wheat, Marshall's No. 3 and Majestic, and also Algerian oats, were very healthy and promising. Lucerne growing on a flat, with water about 10 ft. from the surface, had done well. The field poppy, which is spreading rapidly in the district, was plentiful at the edge of the crop bordering on the watercourse. Generally, few weeds were to be found in the fields. A patch of "soursops" (*Oxalis cernua*) was giving some trouble, and Mr. Plant stated that in order to avoid carrying the bulbs all over the land all the implements were carefully cleaned after cultivating this patch. The fallow paddocks were in first-class order and the three-year course of fallow crop and grazing was commended. After the inspection the visitors were entertained by Mr. Plant.

Hartley, October 21.

PRESENT—Messrs. Wundersitz (chair), Dunn, Reimers, Pratt, J. and T. Jaensch, W. and C. Brook (Hon. Sec.), and two visitors.

STACKING SHEAVED HAY.—Discussion on this subject took place. Members advised putting a layer of loose straw on the ground first, as the bottom sheaves would then keep in better condition. A stack with square corners was considered preferable to a round-cornered stack. When the stack is built, put on a coating of loose straw, straighten it up, and then cover with wire-netting. The netting will keep the straw in its place, and fowls will not be able to do any damage to the roof.

Kingston, October 24.

PRESENT—Messrs. Wight (chair), Lloyd, Goole, Redman, Pinches, and Barnett, and two visitors.

OFFICERS.—Messrs. F. S. Wight and W. W. Pinches were elected Chairman and Hon. Secretary respectively.

CONGRESS.—The Chairman gave a *résumé* of proceedings, and some discussion on lucerne took place. Planting in May on sandy soil and in September on flat, wet land was advocated by different members. Two instances were quoted where the lucerne had done poorly, but on the land being ploughed up for cropping the lucerne had come on again, and had grown splendidly.

Cherry Gardens, October 11.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Potter, Burpee, Hicks, and Ricks (Hon. Sec.).

CO-OPERATION.—Mr. T. Jacobs initiated a discussion on co-operation in the disposal of fresh fruit, and contended that the idea was not practicable. [Probably other Branches would like to know the grounds upon which this conclusion was arrived at, and also what the other members of the Branch think about it.—Ed.]

Gawler River, October 21.

PRESENT—Messrs. Dawkins (chair), Roediger, Hillier, Spencer, Baldwin, Winckel, and Leak (Hon. Sec.), and one visitor.

THE TWINE BINDER.—Mr. Baldwin initiated a discussion on the working of the binder. He thought that for want of a little knowledge and attention these machines were often worn out much quicker than should be the case. Oiling was most important. None of the bearings should be allowed to run dry. The chains must run free and easy. The knife requires careful attention. The blades must not be allowed to become short, and the knife should be kept clean. He thought if the fingers were closer together it would be better. Members thought two qualities of oil should be kept for the binder—a thin oil for use in cool weather and a thicker oil for hot weather. They found that pouring water on the knife frequently when working would keep it clean. Owing to the constant tension the links of the chains stretch, causing the chain to lengthen. This results in the sprocket wheels wearing. When working on sandy land the chains should not be oiled.

Strathalbyn, October 17.

PRESENT—Messrs. M. Rankine (chair), W. M. Rankine, Fischer, Cockburn, and Cheriton (Hon. Sec.).

WHAT IS FALLOW?—Some objection was taken to the title "Fallow Cropping" of paper read at previous meeting, some members being of opinion that fallow meant rest. It was decided to ask Professor Perkins's views on the subject. [Professor Perkins's reply is as follows:—"Unquestionably originally to fallow land implied simply that it was broken up and maintained for a period of time free both from weeds and crop; in other words, the land was supposed to be given an opportunity to recover from the heavy strain of carrying unnaturally heavy vegetation. I imagine that the term fallow crop came into use when it was ascertained that similar results could be secured by changing the crop, and this applies both to the rest which land is supposed to require and to the necessity of freeing it from the weeds that invariably go to seed in crops, such as the cereals, that cannot otherwise be cleaned. It follows, therefore, with reference to the questions of the Strathalbyn Branch, that bare fallow, as we understand it, is essentially what was originally understood by fallow land. The term has, however, no necessary connection with the ploughing in of any plant grown on land as a green manure. Generally speaking, a fallow crop is a hoed crop, that admits of cleaning the land before wheat or any other cereal. In this sense maize or sorghum are both fallow crops. Pease or beans would also be fallow crops, whether they were ploughed in or harvested. The great objection to them, however, is that they offer almost insuperable difficulties to the proper cleaning of the land, unless actual hand weeding is resorted to. In brief, a fallow crop implies a subordinate crop that in a sense prepares the way for the main crop, whilst at the same time utilising the land to a certain extent."]

CONGRESS.—Papers on lucerne and complete harvester, read at Congress, were discussed.

WHO IS THE BREEDER?—In connection with stock at shows, the question of a man buying a cow in calf and showing the progeny later on as the breeder thereof was raised. Some of the members contended that the owner in this case was not the breeder. [I have made enquiries amongst authorities, and it is generally admitted that in the true meaning of the term the breeder is the person responsible for the mating of the parents of the animal.—Ed.]

Mount Remarkable, October 20.

PRESENT—Messrs. Casley (chair), McIntosh, Challenger, Karger, Giles, T. P. and G. P. Yates, Morrell, and O'Connell (Hon. Sec.).

CO-OPERATION.—Mr. M. G. Giles read a paper on this subject. It was to be regretted that the farmers, who, as a body, had most to gain from co-operation, were so disinclined to unite with their fellow-cultivators. By some co-operation and socialism appear to be classed as the same thing, whereas, as a matter of fact, co-operation is beneficial to the individual, in that it helps him to increase his profits. Co-operation appeared to him to be the most dangerous enemy of socialism. By co-operation each member gains strength and can do better with his produce than can the individual. When each grower brings a small lot of produce to sell he weakens the market, and the buyers take advantage of the fact, but with only one large seller the position is reversed. Besides this, they can buy cheaper as a co-operation than as an individual. In other countries there is not this objection to co-operation amongst the producers, and much good work has been accomplished by various co-operative societies. While many farmers here were thorough in their belief in co-operation others will only patronise their co-operative concern so long as they can see a direct profit, and if they can get, say, ½d. a bushel extra by doing so they will go to a private dealer. They overlook the many indirect benefits derived from the co-operation. Even with the local butter factory, although it had raised the local price for butter to the extent of at least 1d. per lb. there were members who would desert it for the sake of an extra ½d. per lb. They lose sight of the fact that loyalty to the society is essential to its success, and that its failure will cause the price to fall to the old level. With the exception of Mr. Challenger, all those present were in full sympathy with the principles of co-operation, and were agreed that if farmers and producers generally were to combine more they would find their conditions much improved.

Naracoorte, October 8.

PRESENT—Messrs. J. G. Forster (chair), Wardle, Duffield, Coe, H. A. Forster, Cotten, and Schinckel (Hon. Sec.), and several visitors.

CONGRESS.—Mr. Wardle reported on proceedings of Congress.

HOMESTEAD MEETING.—This meeting was held at the Chairman's residence, an inspection of the crops, stock, etc., being made. The first matter of interest that came under notice was a large paddock now in pasture which was cultivated and manured with super five years previously. The land was carrying a thick coat of grass, and was in great contrast to the land on the other side of the fence. A field of 295 acres sown to wheat was next inspected. Most of it was very promising, though some of the varieties of wheat were more forward than others. Where manure had not been applied the crop was very backward. The cowshed is all under one roof, and a separate stall is provided for each cow. The floor is paved, and has a good slope. Close handy is a shed in which the cows' feed is mixed, a fair amount of molasses being used. After the inspection members were entertained by Mr. and Mrs. Forster.

Gumeracha, October 24.

PRESENT—Messrs. Monfries (chair), Moore, Bond, Stephens, Kitto, Hanna, Sandercock, A. E. and W. A. Lee, and Martin (Hon. Sec.), and one visitor.

WOODSIDE CONFERENCE.—Delegates reported on proceedings of this Conference, and specially commended Mr. Desmond's address on animal physiology and treatment of stock complaints.

GRASS MANURE.—Mr. Kitto stated that the plots on which he applied manure last year did not look any better now than the unmanured land.

FRUITGROWERS' ASSOCIATION.—It was decided to arrange for meeting of fruitgrowers to consider question of forming a Branch of this Association at Gumeracha.

Morchard, October 22.

PRESENT—Messrs. Scriven (chair), Toop, Kirkland, Reichstein, Forbes, Kupke, O'Loughlin, Kitto, Martin, McDougall, and Beck (Hon. Sec.), and two visitors.

AGRICULTURAL COLLEGE.—Mr. Kirkland reported on a recent visit to this institution.

FEEDING AND MANAGEMENT OF HORSES.—Mr. Scriven read a paper on this subject. He advised breaking in a horse at two and a half years to three years old, giving plenty of handling, but not much work. He preferred using an open bridle to winkers, as they were then not so timid, and could see better what they were expected to do. He would work young horses separately. In feeding chaff he preferred it cut to about 1 in. in length, as there was not so much waste as with short chaff, and it was free from dust. He was not in favour of giving wet mixed feed, as the horses got no chance to sift out the dust, as they did with dry feed. Considerable discussion ensued. Some members suggested that it was a good plan to throw young horses once or twice, as it would help them to realise that they were mastered.

Lucindale, October 22.

PRESENT—Messrs. Feuerheerdt (chair), Carmichael, Tavender, Limbert, and Beaton (Hon. Sec.), and two visitors.

UNDERGROUND GRUBS.—Mr. Carmichael reported that these grubs were doing a lot of harm in his grass paddocks.

LAMBS DYING.—Considerable losses of lambs were reported, worms being the apparent cause in many cases.

BRANDS ACT.—A lengthy discussion on the proposed amendment of the Brands Act took place. Members were not altogether in accord with the proposals, but the registration of earmarks met with support.

Bowhill, October 21.

PRESENT—Messrs. Whitfield (chair), Pilmore, A. and E. P. Weyland, J. Waters, Drogemuller, and J. Waters, jun. (Hon. Sec.), and one visitor.

REPORTS.—Mr. E. P. Weyland reported that Gravestock's Frampton, Baroota Wonder, and Marshall's No. 3 wheats had gone down badly owing to the heavy winds. The Hon. Secretary tabled samples of skinless or sugar pea. Where super was applied in the drills the plants were much stronger than those unmanured. In reply to question he stated that he found the dark peas did well when drilled in with manure, but the white peas appeared to be injured by the manure, and did not come up well.

STOCK COMPLAINTS.—Mr. E. Weyland reported foal suffering from strangles, and asked whether he should open the gathering. Mr. C. Drogemuller advised leaving it alone. [See article in this issue by Veterinary Surgeon Desmond.—Ed.] Mr. E. Drogemuller had had several cows affected by redwater, usually about fourteen days after calving. He had cured the complaint with doses of aconite and nux vomica. He also gave a little sulphate of iron in the drinking water.

Cradock, September 24.

PRESENT—Messrs. Paterson (chair), Ruddock, Gillick, Graham, Solly, Gleeson, and Garnet.

STANDARD BUSHEL.—Delegates reported on proceedings of Congress, dealing specially with the discussion on standard bushel. They thought Mr. Darling should be well pleased with the result, but from the farmers' standpoint the discussion was a farce. It was all very well for Mr. Darling to say that those who sold their wheat last season before the standard was fixed got a better price than those who sold under the reduced standard. This had no bearing on the principle at stake, and they might just as well ask what if wheat had risen in price after the standard had been reduced.

Koppio, October 27.

PRESENT—Messrs. Gardiner (chair), Roberts, Jacobs, Newell, and Brennand (Hon. Sec.).

INAUGURAL MEETING.—Messrs. G. B. Gardiner, J. O'Shanahan, and T. Brennand were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year. Matters in connection with the working of the Branch were dealt with.

WHEAT DYING.—Members reported wheat crops to be dying off in patches, chiefly on the low flats. This was attributed to the very wet state of the land during July and August, causing the roots to perish, the consequence being that with the dry weather in September the plant failed. It was agreed that it was not advisable to sow early-maturing wheat before June in this locality.

Forest Range, October 20.

PRESENT—Messrs. Monks (chair), Townsend, Hackett, R., H., J., and A. Green, Vickers, Trevenen, and F. Green (Hon. Sec.).

SPUR PRUNING.—Mr. J. Green read a paper on this subject. The value of spur pruning of apple trees having been thoroughly proved, the question of when to prune becomes one of great importance. This, of course, will vary with the locality. Forest Range was probably the latest district in the hills, being about a month behind Norton's Summit, so that operations would necessarily be started later. Then, again, the character of the season will play an important part. In a dry autumn operations could be started earlier than in a wet season. Each grower must, therefore, exercise his own judgment in deciding when to prune. The tree must have stopped growth for the season. Usually here this will be about the middle of March, though it may be well on in April before they could start on the trees growing in the bottom land. As it was labour thrown away if the shoots grow again, it was better to start a little late than too early. Different varieties of trees will require different treatment; some after they come into full bearing will want a lot of summer pruning, while other kinds will require little or no pruning in the summer, but treatment in the winter, to ensure new growth each year. Generally the vigorous growers need summer pruning after they are in full bearing. The shoots must not be cut too short, say, 3 to 4 in., with some varieties, and even longer with others, especially the Jonathan, on which at least 6 in. should be left.

Quorn, October 22.

PRESENT—Messrs. Thompson (chair), Patten, Toll, Salmon, Rowe, Finlay, Noll, Cook, Brewster, and Walker (Hon. Sec.).

EXHIBITS.—The Hon. Secretary tabled bunch of lucerne showing 2 ft. 3 in. of growth since previous month's meeting; also some nice stems of rhubarb, and strongly advised members to plant. About half a dozen roots of these would supply sufficient rhubarb through the summer for a large family.

LIST OF MANURES AND THEIR USES.—It was resolved that the Department of Agriculture be asked to publish a list of fertilisers, showing those best adapted respectively for agriculture, horticulture, and floriculture. [It is quite impossible to do this, as conditions of soil, climate, moisture, cultivation, etc., will in the individual case largely affect the results obtained from the use of any manure, whether it be in the wheatfield, the orchard, or the flower-garden.—ED.]

PRICE OF WHEAT.—Mr. Finlay read a short paper advocating the adoption of a standard price for wheat, which was the staff of life, the same way as there was a fixed price for gold of standard purity. Members were of opinion that this idea was quite impracticable.

SOIL.—Mr. Rowe read a paper dealing with the respective classes of soils, and the necessity for careful study by the cultivator of the properties and qualities of each kind of land on the holding. An interesting discussion followed.

Riverton, October 29.

PRESENT—Messrs. A. J. Davis (chair), H. A. and W. B. Davis, W. and E. Kelly, Malcolm, Gray, Badman, Camac, and Cooper (Hon. Sec.), and six visitors.

HAY.—Mr. H. A. Davis read a paper on the growing and treatment of hay. To grow good hay it was quite as necessary to fallow and work the land well as for a wheat crop; in fact, more so, as weeds that will not injure the sample of grain will be gathered by the binder, and will greatly deteriorate the quality of hay. Many farmers cut their lightest crops for hay; this, in his opinion, was a great mistake. A crop that will cut only 10 cwt. of hay will often yield 10 bushels of wheat; whereas a heavier crop may go 30 cwt. to 2 tons per acre, but will yield only 15 bushels. The heavier crop will pay better to cut for hay, besides yielding a better quality article; besides, if the heaviest crop is cut for hay there is less risk of loss from rough weather. It is difficult to say which was the best wheat for hay, as they were often uncertain what they would cut until haymaking time arrived. They must, therefore, select good all-round wheats, and, in his opinion, Majestic, Marshall's No. 3, Petatz Surprise, Gluyas, and King's Early were amongst the best. For hay alone the Purple Straw, Tuscan, and other old varieties were better, as they kept a better colour when well on to maturity than did the present white-straw wheats. If the land is dirty with oats, an early variety must be grown. He liked to sow thickly—with early wheats $1\frac{1}{2}$ bushels to $1\frac{1}{2}$ bushels per acre, and not less than 1 bushel of the better stooking varieties. For a hay crop he preferred to drill in the manure about March or April, and broadcast the seed later on. From 5 cwt. to 6 cwt. per acre more hay will be obtained than when sown in drills, and the crop is much easier to cut with the binder. Another great advantage in having some of the land manured in advance was that after wet spells during seedtime they could go on with their broadcast seeding until the land was fit to drill again. Bonedust should be applied as early as possible; but the soluble superphosphates might be carried down too far for the wheat to get the benefit at the start if heavy rains fall soon after it is applied. After seeding harrow well with light harrows, taking care to keep them clean, and avoid dragging. All stones and sticks should be cleared off the land, and when the crop is well above ground, and before the land sets, roll to level the ridges left by the harrows. Neglect in this direction meant considerable loss of hay, as the binder must be set to clear these ridges by at least an inch. He had seen hundreds of acres on which 5 in. to 6 in. of the best hay had been left on the field, because of the neglect to secure a level surface. This 4 inches or so over 200 or 300 acres represented a considerable amount of hay. Whenever a farmer has a fair quantity of hay to cut he should use a good binder. The hay is free from dirt and dust, and if well stooked it will stand a lot of wet weather without injury. Besides, the binder cleans the land, and the crop is harvested in less time and labour. Two men and a boy with a waggon and team can cart and stack in the paddock 15 to 20 tons of sheaved hay per day. Care should be taken to have the binder thoroughly overhauled some time before it is needed. A few shillings spent in putting it in good order is money well spent. For market the crop must be cut with a good green colour in it. The time has gone when grain was considered essential in good hay, and, for export, chaff without colour is looked upon as of little value. He advised stooking almost immediately after the binder, making long, narrow stooks, say one sheaf in the centre and two on each side. Avoid making the sheaves too large. If these two points are attended to, it will not matter how green the hay or how much rain may fall; good wheaten hay will not suffer much in the stook. Hay should be stacked as soon as possible after it is dry enough. It comes out of the stack in much the same condition as it goes in, and if allowed to lay out in the field until parched and dry it will come out of the stack, even in the middle of the winter, in the same state. Such hay cannot be got into a good condition for chaffing, but will split and be dusty, especially if bound in large sheaves. He believed it would pay every farmer to stack his hay promptly in the paddock, instead of carting direct to the chaff mill; the extra weight would pay for the extra labour. The site for the stack should be high and dry and easy of access. He had seen stacks built in positions from which it would be impossible to remove the hay during the six months of the year. In this district the stack should be set out with the end facing west, so that the narrow surface only is exposed to the weather. Care should be taken not to build too large a stack; one 20 yards \times 7 yards \times 21 feet, will hold about 100 tons; the same quantity will go into a stack 17

yards \times 8 yards \times 21 feet, and he preferred the broader stack, as being easier to build. A good layer of straw or wheat chaff, or preferably sheaved wheaten straw, should be put on the ground, to avoid loss of good hay. He found it easiest, quickest, and best to lay the sheaves with the fork, putting the butts outwards, and laying the second on the strings of the first right through the stack. The two outside rows must not be stacked too tightly. He had seen some men pack, and even knee, the outside rows, while throwing into the middle anyhow. This resulted in the middle settling down more than the outside, and the rain, instead of running off, goes into the stack. If the middle and sides are equally packed, and an extra layer put in the middle occasionally, very little rain will go into the stack, even if a fall occur before it is thatched. In building the stack, take care that it "grows" a little as the sides are raised, so that the water will drop clear when the thatch is put on. Thatching should be done, and done well, as promptly as possible after the stack is finished. He had often seen good stacks of hay that had cost perhaps £100 or more to grow and harvest left unthatched, with the result that half is thrown away and useless, and the rest causes much unpleasantness with the chaff merchant. Valuing straw at £1 per ton, the cost of thatching such a stack would not have exceeded £4 to £6. In regard to selling hay, he would advise the farmer to sell a portion of his crop every two or three months. By doing this he would get an average price, and in the long run it would be better for both farmer and merchant. It was a great mistake for farmers to hold on to large stocks late in the season, more especially when hay is dear. Thousands of pounds were lost last year by both farmers and chaff merchants from this cause. Farmers refused £4 per ton at the end of the season, and many sold afterwards at £3 to £3 10s., while some have not yet disposed of their hay. He would always advise them to sell on a rising market, and avoid spoiling their hay by a penny-wise pound-foolish policy. Considerable discussion ensued. Some members favoured round stocks in preference to long ones, as they stand the rough weather better, and if put up properly will resist damage by rain. Some members favoured stacking butts out, except on the roof, where it was preferable to put the heads outwards, as the stack would not then require thatching, if the roof has a good fall.

Eudunda, October 24.

PRESENT—Messrs. Walter (chair), Krummel, Pfitzner, Kluske, Schwarz, Schiller, and Weil.

WIRE-STRAINER.—Mr. Schiller tabled homemade wire-strainer and fence-mender, which was favourably commented upon.

TRAVELLING STALLIONS.—Considerable discussion on this subject took place. It was stated that there were 15 or 16 stallions travelling the district, yet it was a rare thing to see more than two or three of them exhibited at the local shows. Members thought if these horses were good enough to travel the district, they should be worth showing. It was agreed that only sound horses should be used for breeding purposes, and veterinary examination of all travelling stallions was advocated. The Hon. Secretary suggested the imposition of an annual licence fee of £5, which should be devoted to prizes for stock exhibited at the shows in the districts the horses travel in.

Arthurton, October 27.

PRESENT—Messrs. Hawke (chair), Short, S. T. and T. Lamshed, Welch, Rowe, Wicks, and Palm (Hon. Sec.).

STOCK COMPLAINTS.—Mr. Rowe reported loss of horse from what appeared to be dropsy, but the treatment prescribed for this complaint did no good. Mr. Short stated that to bring away the afterbirth from mares he boiled 1 lb. of currants in a quart of new milk, and mixed it with some bran. The mare would eat this mixture readily.

INFERIOR BARB WIRE.—In reply to question of cause of barbwire rusting so quickly, the Chairman stated that it was due to inferior material; only the best quality should be used; the cheap lines should be avoided, as they were usually of little value.

Reeves Plains, October 21.

PRESENT—Messrs. Folland (chair), Carroll, Condon, Day, Alexander, Arnold, Gaumeau, R. H. and W. Oliver, and McCord (Hon. Sec.), and one visitor.

THE FARMER AND THE MIDDLEMAN.—Mr. J. J. McCord read a paper on this subject. There was practically no body of men who did not combine to protect their interests save the farmers, who, above all others, should be united. The consequence was that the farmers were, in a sense, got at by all sorts of combinations, and the only remedy for them was to form a strong union themselves. Only recently, in the case of the importation of harvesters, they had an instance of attempts being made to impose heavier duties—which the farmer would have to pay—for the benefit of the local manufacturers. The correspondence on this subject indicated that the farmer was already paying too much for these harvesters, and he thought they should endeavour to lessen the cost. Possibly the action of some of the Branches in refusing to deal through agents was a step in the right direction. He had no fault to find with importing firms having the agency of certain machines—the evil they had to combat was the travelling agent. Nearly every one of these firms has a number of agents running all over the State, and the expenses attached to this must be very great. As the farmer had to pay these expenses, they were justified in doing all they could to deal direct with the importers or manufacturers. In the Wimmera district a strong union of farmers had been formed, and they intended to deal direct with the manufacturer whenever possible. On manures and cornsacks, which they were importing direct, they would make a considerable saving; other lines they were buying in bulk. On machine oil they saved 5d. per gallon in this way, and he could not see why the farmers in South Australia could not do the same. Members generally agreed with the writer, though some thought the travelling agents did good. All were quite satisfied that a higher duty on harvesting machinery would mean increased prices to the farmer. It was resolved that the members of this Branch believe in co-operation amongst themselves.

Petersburg, October 29.

PRESENT—Messrs. Miller (chair), Bottrill, Travers, Philp, Nourse, and Wilson (Hon. Sec.), and two visitors.

WEED.—Mr. Bottrill tabled sample of *Asphodelus fistulosus*, which he stated was growing vigorously on the roads and watercourses near Petersburg.

CIVIL SERVANTS AS JUDGES AT SHOWS.—The Hon. Secretary read letter from Hon. Minister in reply to request that the Dairy Instructor should judge at the local show, stating that he was opposed, on principle, to Civil servants acting as judges at these shows.

ADELAIDE SHOW.—Mr. Bottrill read an interesting paper dealing with what he saw at the Adelaide Show. He was strongly opposed to the system of single judging, the majority of the members present being of the same view.

Wandearah, October 26.

PRESENT—Messrs. Munday (chair), Wall, Fuller, Stanley, Davidson, Ferme, Roberts, E. H. and E. J. Eagle (Hon. Sec.).

GRADING OF WHEAT.—Considerable discussion, arising out of Congress report, took place on the subject of grading of wheat. Some members thought that if large graders were erected at the principal ports all wheat for export could be graded to a given standard, which would have the effect of raising the standard and the price of South Australian wheat. Other members thought that if anything was to be gained by grading wheat in this way it would have been undertaken by the wheat merchants before now.

DETERIORATION OF WHEATS.—Several members referred to the falling off in quality of certain wheats. Some varieties did not do so well now as formerly; the rust-resistance of certain varieties had fallen off considerably. It was considered that this pointed to the fact that securing and testing new wheats should have the careful attention of the Bureau.

Bute, October 24.

PRESENT—Messrs. A. Schroeter (chair), H. Schroeter, Sharman, Buchanan, Stevens, McEvoy, and McCormack (Hon. Sec.), and two visitors.

PROFITABLE FARMING.—Mr. Masters forwarded paper on this subject. The aim of the farmer should be to obtain all the profit possible from his farm, and to secure this he should pay attention to all sources from which he can secure a profit. Under local conditions they required about 1,500 acres of land to secure satisfactory results. Twelve horses and two men will be required throughout the year, working at steady pressure. The land should be fallowed early as possible; fallow and sheep were essential to success. The farmer should keep at least 200 breeding ewes and about 100 pigs on a farm of this size. The fallow should be sown during April and May, and some of the stubble land sown earlier, with a late wheat, for hay. A portion of the wheat crop should be cut and headed, as this practice not only lessened the risk of loss by storm, but provided a good stack of straw as a stand-by in drought. For working the fallows he preferred the nine-furrow plough, as it killed all weeds. Mr. Sharman generally agreed with Mr. Masters, but preferred the cultivator for working the fallows. He did not think pigs could be profitably reared on their farms on such a large scale as suggested. Several members considered more strength was required to work a farm of 1,500 acres. It was generally agreed that the system of one crop in three years was the best for this district. It was not considered advisable to sow a late-maturing wheat on the stubbles for hay. Cutting portion of the wheat crop early and heading it was advocated by several members, and Mr. Buchanan instanced a farmer who kept a large number of stock alive during a dry season by feeding them on straw mixed with molasses.

Mount Pleasant, November 11.

PRESENT—Messrs. Phillis (chair), Tabscott, Maxwell, Miller, Drogemuller, Godfree, Giles, Thomson, and Vigar (Hon. Sec.).

MANGELS.—Mr. Vigar reported on proceedings of Woodside Conference. Members could scarcely credit the statement made by Mr. Griggs that up to 100 tons per acre of mangels had been grown in England. Some of the members had tried the paris green, bran, and sugar mixture recommended by Mr. Pearson for killing grubs, but it had not proved a success. [This mixture has for years been used successfully for destroying the night-feeding caterpillars in vines, mangels, and other crops. These caterpillars usually hide in the soil close to the plant during the day time. For ordinary caterpillars that remain on the plants it is not likely to be effective.—Ed.] Mr. Maxwell gave an interesting account of turnip growing or feeding stock in Scotland. He did not, however, think the crop would prove profitable in this locality.

Mallala, November 7.

PRESENT—Messrs. Temby (chair), Moody, Jenkins, Murphy, Wilson, Worden, McCabe, Marshman, Nairn, Loller, and Nevin (Hon. Sec.), and five hon. members and two visitors.

PINNAROO.—Mr. J. J. McCabe read a very interesting paper describing a recent visit to Pinnaroo district. Leaving Tailem Bend and going east to Moorlands Woolshed, eleven miles distant, the country is composed of a light, sandy soil, a few inches in depth, over limestone rock. It is covered principally with pine and sheoak and is fairly grassed, but on the whole it seems a dry country. At the woolshed the land improves. A crop of 300 acres, not manured, gave last year a return of 17 bushels. According to present appearances this year's prospect is about 8 to 10 bushels per acre. From here to Polly's Well the land varies, and, on the whole, will be difficult to farm. Polly's Well is about 40 ft. deep, and contains good stock water. The next stage is 18 miles on, to Parrakie Well, and is very good country. There is plenty of mallee and bush, and where patches of the scrub had been recently burnt the grass is now 2 ft. high, and wild flowers in abundance. For a considerable distance, about six miles,

there runs a limestone range. Along its sides the soil is a good sandy loam, over red clay. In many places are fresh water springs or soaks, which afford a good supply for stock. After leaving the range the land still continues favourable. Water can be got at a fair depth and of a good quality. The low mallee scrub is dense, although it would be easy to roll down and clear by burning. Parrakie Well is about 180 ft. deep, and has an abundance of fresh water. From there to Wow Wow is 16 miles. This tract is composed of low, sandy ridges, running east and west. On the flats, the soil is sandy loam over red and yellow clay. Numerous crab holes are to be seen, and in places are iron ore patches. At Dingo Plain, halfway, the mallee is bigger, suggesting that the country has not been so frequently subject to bush fires as other parts. Spear grass is plentiful. Approaching Wow Wow the land improves, and more settlers are in evidence. The soil is chocolate over red and blue clay. The open plains are well grassed. A crop of wheat was seen here, which appeared to be worth about 8 bushels. The land was ploughed up and seed put in without manure. The well at Wow Wow is about 200 ft. deep, with a good supply of fresh water. From Wow Wow to Pinnaroo is about 24 miles. The land varies in the first part of the stage. High sandy ridges are numerous. Low mallee and dense bush are plentiful. Arriving at the Pinnaroo boundary, a marked improvement is noticeable. The soil is more uniform, consisting principally of chocolate loam over red clay. The Pinnaroo well is about 210 ft. deep, with an abundant supply of fresh water. There are about 200 acres cleared on the newly selected blocks ready for cultivation next year. The grass is good upon the open plains, and the timber is big where preserved from fire. The rainfall of Pinnaroo averaged about 14 inches. On the whole, he was favourably impressed. He felt certain that most of the present selectors would require a premium before parting with their selections. When railway facilities were afforded, Pinnaroo, he was confident, would become a valuable asset to the agricultural areas of the State.

Waikerie, November 5.

PRESENT—Messrs. Perry (chair), Jones, Blizzard, Starr, Rogers, Allen, A. Lewis, sen. and jun., and Green (Hon. Sec.), and four visitors.

HOMESTEAD MEETING.—This meeting took the form of a visit of inspection to the horticultural blocks at Ramco. Mr. Perry called attention to disease in some vines which was strange to members, and it was decided to send specimens to Professor Perkins for identification. Grasshoppers were reported to be present in great numbers and doing much damage to vines and trees at Waikerie.

Koolunga, November 17.

PRESENT—Messrs. Button (chair), Jose, Palmer, Perrin, Burgess, Lawry, and Noack (Hon. Sec.).

COMPLETE HARVESTER.—Mr. F. S. Burgess read a paper upon this subject. While he was of opinion that in the future the complete harvester would largely displace the ordinary stripper, most of those who had good strippers and winnowers were not in a position to discard them for the harvester. Besides, the price of these machines, as is usual with new implements, is at present very high, prices ranging from £72 to £100. There was no doubt of the labour-saving character of the harvester, as a farmer employing five men and using the ordinary stripper could, with the harvester, get through his work with three men. The fact that harvester could be worked from early morning until late in the day, so long as the crop is ripe, the land not too wet, and the day fine overhead, was of great importance. At the same time, however, if the grain is harvested damp it must be turned out of the bags and re-winnowed, or it will heat and get weevilly. He had heard that a number of farmers in Victoria had discarded the harvester for the stripper, because the former machine scattered the chaff and weed seeds all over the field. This difficulty was, however, overcome by the use of the chaff-carrier. He would very much like to see farmers supporting the locally made farm implements. It was stated that one large American firm

employed about 8,000 men and boys; this probably meant that 25,000 people were dependent upon these works. As Australia had plenty of coal and iron, he could not see why, if the local manufacturers were properly supported, they could not turn out implements just as good and as cheap as they could be imported from America. A large and thriving manufacturing population would mean a much better market for the farmer's produce, and increased prosperity generally. Members were unanimous that the harvesters did their work well, the only practical drawback being the loss of chaff, which was of considerable value to the farmer.

Penola, November 12.

PRESENT—Messrs. Darwent (chair), Peake, McBain, Alexander, Worthington, Pounsett, Stoney, Ricketts, and Allnutt (Hon. Sec.).

RAILWAY EXCURSIONS.—Members were of opinion that the Railway Department should be asked to issue excursion tickets to Adelaide every three months from stations fifty miles or more from the city. This concession would be in the interests of farmers and producers generally, who often cannot avail themselves of the ordinary excursions.

RAPE, KALE, AND MUSTARD.—Members desired information as to the best way to harvest seed of rape, kale, and mustard. [Can any member advise on this matter?—ED.]

Millicent, November 3.

PRESENT—Messrs. Harris (chair), Stuckey, Stewart, Varcoe, Holzgreffe, Oberlander, Hart, Magor, Hutchesson, Mutton, McRostie, Boncham, and Campbell (Hon. Sec.).

ROPE FROM WASTE BINDER TWINE.—Mr. Holzgreffe tabled ropes made from waste binder twine. Though not as neat as ordinary rope, owing to the number of knots in it, it made a very serviceable rope for tying up horses, etc. In reply to question, he said it would not pay to employ any one specially in making rope; but they could profitably devote some of their time on wet days to such work. Mr. Hutchesson thought the extra man that would be required to remove the bands when cutting the chaff would curtail any advantage from saving the twine. Several members considered that if the twine was cut up with the chaff it was likely to injure horses eating it.

PRUNING FRUIT TREES.—Mr. Mutton gave an address on this subject, adversely criticising the system of spur pruning advocated by Mr. Quinn. He stated that he had visited a number of orchards near Adelaide, but did not find a grower who agreed with the new method. [Evidently Mr. Mutton did not seek in the right quarters for practical demonstrations of the value of spur pruning.—ED.] He did not believe in continually tipping back the new wood, but would allow it to grow naturally, and when it got too thick would then cut it. Spur pruning, in his mind, was just pruning the trees to death. Mr. Campbell pointed out that this system was very largely practised, and with great success, in Tasmania; it was recommended in Bailey's "Pruning Book"; and was the outcome of years of careful study and experiment. In his own orchard he had adopted it, and though some of his friends said he was pruning the trees to death, they were still healthy, and were clothed with fruit spurs from the crutch to the two-year-old wood. Mr. Hart, in referring to the pruning of fruit trees, stated that some growers made the mistake of pruning on to two-year-old wood, with the result that the shoot was likely to succumb. By severe pruning they secured plenty of fruit spurs along the limbs; if too many, it was a very simple matter to remove some.

GRAZING V. CULTIVATION.—At August meeting Mr. Holzgreffe read a paper in which he contended that it was more profitable to utilise their land for grazing than for wheatgrowing. In criticising the paper, Mr. Campbell contended that this could only be done on a holding larger than the average. He thought in the first case Mr. Holzgreffe had made a mistake in basing his calculations on the past three years, as stock had been unusually profitable, whereas, owing to the very wet season, the wheat crop had been below the average. There was, of course, no comparison between the results of grazing on land that had been merely cleared of tussocks and timber and on land

that had been broken up and was now laid down to good grasses. Apart from the actual question of profit to the owner, there was no question that, from a national point, if Mr. Holzgrefe's contention was correct, it would be a bad thing for the State if less land in the South-East was cultivated and more land merely grazed. Mr. Holzgrefe said he was satisfied that in the South-East the man who had to employ hired labour got little or no profit out of wheat. Several of the large landholders had tried wheat, but found stock more profitable. Mr. Stewart said that had been their experience at Rendelsham. Mr. Magor stated that better crops of wheat were grown on the poor soil with the aid of super than he could grow on heavy, black land.

Kapunda, November 5.

PRESENT—Messrs. O'Sullivan (chair), S. A. and G. Harris, Flavel, Shannon, Teagle, Pascoe, Banyer, Daly, Vogt, O'Dea, and Holthouse (Hon. Sec.).

FALLOWING.—Mr. Windebank forwarded a paper on this subject. He advocated fallowing as early as possible. If he could manage it he would finish not later than the end of August. The land should be harrowed lightly and then cultivated before the end of October. In suitable places, such as the sandy flats along the river, he would sow some melons on the fallow. Cattle and pigs did well on the fruits. A few acres of sorghum might be sown on such land and be fed off close in time to get the land ready for wheat. Seckling should be started about the middle of April and finished by the middle of May. He favoured Marshall's No. 3, Majestic, Silver King, and Comeback wheats for this district. Members generally agreed with Mr. Windebank, though it was admitted that it was impossible to lay down any hard-and-fast rules on the subject of fallowing.

PRESENTATION.—The Chairman presented Mr. G. Harris, on behalf of the members, with a silver-mounted walking-stick, in recognition of his services as Hon. Secretary for a number of years.

BARLEY IN MANURE BAGS.—Some discussion took place on the presence of barley in wheat crops, which some members attributed to the use of second-hand sacks for manure. Mr. Shannon said one of his men called his attention to barley seeds in the manure bags, and he had written to the manufacturers about it. The latter had advised him that owing to an oversight some secondhand barley bags had been used, but steps had been taken to prevent its occurring again.

Kingscote, November 14.

PRESENT—Messrs. Turner (chair), Melville, Wright, Bell, Bates, Nash, Hawke, Ayliffe, Neave, and Cook (Hon. Sec.).

BARLEY.—Mr. J. Melville tabled head of Big English barley, with six distinct offsetts, also heads of barley which he had cross-fertilised.

DAIRYING.—Mr. G. G. Ayliffe read a paper upon this subject. Up to the present, dairying had been greatly neglected in this district, and he thought this was to be regretted, as with proper management the dairy herd would be found a reliable source of income. To make dairying pay, they would first have to improve the breed of their cows. To do this, farmers should unite to buy purebred bulls to mate with their best cows. In selecting the cows to breed from it would be well to choose those which respond most readily to good feed and extra attention, as their progeny would be more likely to inherit the good qualities of their sire than the progeny of cows of a fixed type. In selecting the bull care must be taken to choose one of a good milking strain. If possible his dam and granddam should be inspected, and if they are good milkers a pound or two should not prevent them from purchasing the bull, as, although the dairy qualities are essentially female functions, they are very largely transmitted through the sire, hence the value of a good bull in a dairy herd. He thought the milking strain of Shorthorn the best breed of bull to obtain, as they were hardy, and the bull calves would make better vealers, or, if castrated and reared, more useful bullocks than the progeny of either the Jersey or Ayrshire. He had had some experience with the Jersey, and, although splendid butter producers, they required housing or rugging to get the best results. He would

advise farmers on the island to leave the Jersey alone for the present, though it might pay later on, when they had built up the standard of their cows towards the type of the Shorthorn, to introduce a strain of the Jersey to improve the quality of the milk. If they were to make a success of dairying, their cows must have good feed and plenty of it. He had not been long enough in the district to say which fodders would pay best, but he believed kale, mangolds, rape, lucerne, rye grass, and some of the clovers would all do well. For early green feed Cape barley will give good results, while pie melons, sliced, and fed with bran, etc., can be profitably utilised. In the spring they usually had a lot of feed that could be turned to better account if made into ensilage. A liberal allowance of salt should be provided. With a steamer running twice a week to Port Adelaide he hoped to see the separator introduced on every farm where cows were kept. Provided cleanliness was observed in their operations, the cream could be delivered at Port Adelaide in good condition. The separator should be taken to pieces and all dairy appliances thoroughly scalded after use. The skim milk could be put to good use on the farm in feeding calves and pigs. He was convinced there was good money in dairying for the farmers on the island.

Carrieton, November 7.

PRESENT—Messrs. Gleeson (chair), Manning, Ormiston, Hupatz, Davis, Kaerger, Fisher, O'Halloran, Cogan, and Bock (Hon. Sec.).

BREEDING COWS FOR DAIRYING.—Mr. W. Hupatz read a paper on this subject. They were all satisfied that they must turn their attention to something besides wheatgrowing in this district. Their holdings were mostly too small for sheep, consequently they must rely upon dairying to supplement their returns from wheat. To make dairying profitable a herd of good cows was the first essential, but unless blessed with a fair amount of capital the farmer cannot possibly buy such a herd. He must, therefore, do his best to improve the quality of his herd by securing a good bull, and breeding from the best of the cows he has. They must first decide what type of bull was most suitable to their locality. The Jersey was too small and delicate for this locality, while there was a prejudice against the Holstein, though the cows of this strain that he had kept had proved good doers, quiet, docile, and good milkers. For their conditions he believed they would get best results from the Hereford or Shorthorn. He had good cows of both breeds, but, as the former appeared to stand drought conditions better, he would favour a bull of that breed. As it was not practicable for the Branch to buy a bull, he suggested six or eight near neighbours should combine to purchase a good bull, appointing one of their number to take charge of the animal. Instead of shifting the bull from place to place he was satisfied it would be better to bring the cows to him. A fair sum should be paid for the keep of the bull, and a small charge made for the service of the animal. Any surplus receipts could be divided amongst the members at the end of each year. Most of the members favoured the Shorthorn or the Hereford for this district, and it was generally agreed that dairying would pay.

Gawler River, November 18.

PRESENT—Messrs. Hillier (chair), Spencer, Kreig, Winckel, Dawkins, and Leak (Hon. Sec.).

STOCK COMPLAINTS.—Mr. Hillier stated that Veterinary Surgeon Desmond had tested his dairy herd with tuberculin, and had pronounced them healthy. One member reported one of his cows had been suffering from a running sore at the ear. It became so bad that the animal was destroyed. Members thought the sore was probably due to some foreign matter. Some members reported trouble with stock through cocky chaff getting into the eye. Powdered loaf sugar applied as soon as the trouble occurred was said to be effective in remedying it.

BARLEY FOR PIGS.—Members thought English barley was the best kind of barley for feeding to pigs.

Whyte-Yarcowie, November 19.

PRESENT—Messrs. Hack (chair), Lock, Hunt, Jenkins, Pascoe, Faul, Faulkner, and Boerke (Hon. Sec.), and one visitor.

IMPROVED FARMING.—The Hon. T. Pascoe, M.L.C., gave an address on "Intelligent Farmer, or Knowledge Applied to Agriculture." It was now generally recognised that more than mere physical strength and endurance was required by the man who was to succeed in farm work. It was careful thought and experiment that had brought about the improvement seen of late years in South Australian methods of farming. In particular, the system of spelling the land, fallowing, and manuring, had worked wonders. The use of commercial fertilisers had completely changed the aspect in most districts. The wheat yields had been largely increased, while the feed had not only increased in quantity, but also in quality, and they were told by veterinary authorities that cattle fed on grass grown on manured land were freer from the complaint which had caused such losses throughout the State. Farmers must exercise considerable care in the selection of manures, and of wheat suitable to their conditions. The successful farmer of the future will undoubtedly be the man who makes the best use of his brains in applying scientific knowledge to his work. Mr. Pascoe read an extract dealing with results obtained in America by the inoculation of soil with nitrogen-gathering bacteria. Mr. Faul referred to the value of the wheat called Bobs; it was rust-resistant, prolific, and of very high milling value.

INSPECTION OF CROPS, ETC.—On October 22 the members of the Branch paid a visit of inspection to Canowie Sheep Station and to Mr. Makin's farm. Crops generally throughout the district are promising. Locusts are plentiful, and increasing. Members thought some efforts should be made to exterminate them, and that the Government should give assistance in this work.

Mount Gambier, November 12.

PRESENT—Messrs. Edwards (chair), Wedd, Mitchell, Ruwoldt, Williams, Norman, Wilson, Watson, Pick, Barrows, and Collins (Hon. Sec.).

UTILIZATION OF POOR LAND.—Mr. Wedd resumed the discussion on this subject. There were thousands of acres of poor land in the district, carrying about one sheep to five acres, which, in his opinion, could be greatly improved at little expense. If the rushes, etc., were burnt off, and seed of Yorkshire fog grass sown, they would get good feed. Wattles would pay well on their poor, sandy country, and they might pay some attention to growing timber. The splendid forests that formerly existed had been destroyed, and they now had to send to Victoria for split or sawn stringy bark. In many places all they would need to do to get a stand of young red gum or stringy bark would be to fence off stock and keep fires out. On ferny land he would advise sowing cocksfoot grass. Mr. Pick generally supported Mr. Wedd. On the poor, ferny sand he would burn early, plough roughly, and harrow, then sow Yorkshire fog or cocksfoot seed. When the grass got a good start he would stock the land with cattle, as they would destroy the fern in time by tramping it about. Unless they netted the land they could not grow wattles, as the rabbits destroyed the young plants. His experience with wattles was that if they were planted in rows, and the ground broken up in strips 3 ft. to 4 ft. wide, the wattles made as much growth in six years as they did in ten years on unbroken land. It was generally agreed that a mistake had been made in selling the forest lands in the South-East, and also by landowners in burning too frequently, the result being that grass had been all destroyed in many places. Mr. Watson mentioned that good results had been obtained by sowing cocksfoot on the fern land in Benara. Tagosaste, or tree lucerne, was suggested as worth growing on the poorer soils.

SHEEP DIPS.—Stock Inspector Williams read a paper on this subject. The compulsory dipping of sheep for lice and ticks came into force thirteen years ago, and although there had been a marked benefit there was still room for considerable improvement. The amount of money and labour expended in the dipping of sheep should be giving better results. The use of unsuitable dips, particularly the carbolic dips, was the cause of this. Carbolic dips were too volatile, and did not afford protection to the sheep for any length of time. He was strongly of opinion that the non-poisonous dips should not be used;

it was waste of time and money to continue to use carbolic dips. In New Zealand stockowners find it necessary to dip twice a year for lice, and he was sure it would pay to do so in this district. Owners should see that their dips are kept clean, and the liquid at proper strength. Sheep hold the dip better if they have four to eight weeks' growth of wool on them. The Department intended to enforce the regulations providing for compulsory dipping. Owners travelling or exposing infested sheep were liable to a heavy penalty. Persons buying sheep at sales should ascertain if they have been dipped, as sheep were often sold off shears without dipping. Members generally agreed that the arsenical dips were best.

Caltowie, October 24.

PRESENT—Messrs. Royal (chair), Patten, Petatz, Moore, Neate, Kerr, A. and J. McCallum, Jettner, Hewett, Graham, McDonald, J. G. and F. Lehmann (Hon. Sec.).

SUMMER FODDER.—Mr. McDonald read a paper on this subject. Much diversity of opinion exists amongst farmers in the Northern districts as to the possibility of growing summer fodders, and he thought every farmer would do well to set apart 10 to 20 acres of his fallows for experimenting in this direction. Heavy soils, liable to become waterlogged and baked, should be avoided. The limestone and sandy lands of average character were most likely to give good results. Where lucerne will do it should be sown; under irrigation it was, without doubt, the best fodder they could grow. It was also worth trying, as was suggested at Congress, in the cereal crops. Maize planted early in September on well-worked early fallow should give a fair return. Plant in drills 3 feet apart, and sow seed 4 inches deep and 1 foot apart in the drills. Keep the land between the rows cultivated to destroy weeds and retain the moisture. Piemelons might be planted with advantage in strong, deep, loamy soil. The fruits are relished by almost all stock. Sorghum might also be grown under similar conditions to maize. If manured with super, better results will be obtained, and the succeeding cereal crop will also benefit. He was trying *Paspalum dilatatum*, which was so highly valued in the Eastern States; but it was too soon to express any opinion as to its value for this district. A new fodder plant from Algeria, "Sulla," was favourably reported on in the Goulbourn district of Victoria. This plant was stated to be superior to lucerne, thriving on poor soils, and yielding heavily. It should be worth trying here. ["Sulla," or Malta Clover, was imported by the Bureau a good many years ago, and tried in various parts of the State. It has not, however, given satisfactory results in the dry areas.—Ed.] Rape was a fodder from which they should get splendid returns. It should be sown early in the autumn, for winter feed; it would prove invaluable for young stock and lambing ewes.

Angaston, October 22.

PRESENT—Messrs. Rundle (chair), Friend, Player, Plush, Snell, Sibley, S. O. and A. Smith, Trimmer, F. and A. Salter, and Matthews (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—Members paid a visit of inspection to Tarrawatta Station, largely with a view to seeing the shearing operations and the method of woolclassing. The improvements, especially in labour-saving devices, at the shearing shed were carefully inspected and favourably commented on.

SPRAYING.—Mr. S. Plush read a paper on this subject. To secure best results in spraying they should first get their trees into proper shape. A short-stemmed, open centre and spur-pruned tree was most satisfactory. For apricots he advised Bordeaux mixture, made with 8 lb. bluestone, 8 lb. lime, and 50 gallons of water. Usually one application was sufficient; but sometimes a second spraying was necessary. For this the strength should be 3 lb. lime, 4 lb. bluestone, and 50 gallons water. This also applies to peaches, for prevention of curl-leaf. For apples he used the mixture of strength of 5-5-50, and, if necessary, added arsenic for codlin moth. The first spraying for codlin moth should be given as soon as the fruit is nicely set; the second, about three weeks later; and the third, just before Christmas. A fourth

spraying on the later kinds would be necessary about the middle of January; and for the latest varieties, like Rome Beauty, Strawberry Pippin, etc., a fifth spraying was advisable. He boiled 1 lb. of arsenic with 2 lb. of fresh lime in 1 gallon of water for about an hour, and then used 1 quart of the mixture to 50 gallons of water. Mr. A. Salter stated that he had found that they could keep lime fresh and good for several months by placing it in an old carbide drum, covering it with a layer of old lime, and closing the lid tightly.

Utera Plains, November 19.

PRESENT.—Messrs. Hornhardt (chair), Jacobs, Barritt, R. and J. Deer, jun., Chase, Gale, D. G. and A. R. Ramsey (Hon. Sec.), and three visitors.

MULLENISING V. GRUBBING LAND.—Mr. W. Jacobs read a paper on this subject. He had had over 20 years' experience in mullenising scrub land, so he could claim to know something about it. He had come to the conclusion that mullenising was the most unprofitable method of clearing land for cultivation. The main reason for this was that the wear and tear and cost of repairs to machinery on the mullenised land were three times as great as on grubbed land. Besides this, on mullenised land much time was lost both at harvest and seed time. He estimated that it took 20 per cent. more time to deal with a given area of the former land to what it did on grubbed land, while there was always a certain amount of land wasted. If the mullenised field is examined carefully, they would find that for from one to four yards around each large stump there was very little wheat produced. When everything was taken into consideration, he was quite satisfied that grubbing, though more costly at the start, was cheaper in the long run. He suggested that the Branch should endeavour to arrange for a field trial of grubbing machines, as it was important that they should have the cheapest and best machine. Members generally agreed that grubbed land was the most profitable to work; but it was pointed out that less capital was required to start with when the land was only mullenised.

WHEAT EXPERIMENTS.—Mr. Barritt tabled samples of wheat grown from seed distributed by the Bureau. One variety, Boomerang, was considered to promise well for this locality.

Crystal Brook, November 12.

PRESENT.—Messrs. Hamlyn (chair), Hutchison, Davidson, Venning, Billinghurst, and Symons (Hon. Sec.).

SHOEING HORSES.—Mr. G. Davidson read a paper on this subject. A practical farrier should possess a good knowledge of the parts of the foot, and the best way to protect them from injury. The man who followed Nature as nearly as possible would make the best job. In preparing the hoof no hard-and-fast rules as to paring and rasping could be laid down, as the treatment will vary according to the shape of the feet. Some horses have strong feet and high heels, while others do not require the rasp on the heels from one year's end to another. A flat-footed horse requires more protection to the heels than one with strong, well-shaped feet. A well-formed foot should be nearly round, with thick crust and strong, well-defined bars. The frog should not be cut more than absolutely necessary, as the old parts will peel off as soon as the new frog is sufficiently developed. With a good foot rasp sufficiently to get a level bearing for the shoe: do not remove the bars unless there are corns between them and the outer crust. Leave the wall of the foot the same thickness all round. Having prepared the foot, make the shoe to fit it so that very little rasping will be necessary after it is nailed on. For a small shoe five nails will be sufficient, and for draught horses seven nails to each shoe. With horses inclined to brush behind, many smiths make the mistake of cutting away the inside of the hoof. He had tried cutting down the off or outside of the hoof, so that in time the fetlocks will stand farther apart. After shoeing twice in this way he found the horse travelled clean. Many good horses were ruined by bad or careless shoeing.

Dowlingville, November 18.

PRESENT—Messrs. Mason (chair), Montgomery, Phelps, Watkins, Grave, Crowell, Powell, and Lock (Hon. Sec.), and three visitors.

HAYMAKING.—Considerable discussion took place on the question of the best stage at which the crop should be cut for hay. In the opinion of this Branch, the best time for sheaved hay was when the grain was about half formed.

Port Germein, October 22.

PRESENT—Messrs. Stone (chair), Blesing, Smith, Kingcome, Hillam, Gluyas, Mudge, and Basford (Hon. Sec.).

RABBITS.—Considerable discussion took place on the damage done by rabbits. Farmers were taxed to their utmost efforts in these parts to keep the rabbits in check. Phosphorised pollard is found very effective at certain seasons of the year in destroying the pest; but members thought the Bureau should support any efforts that were made to introduce any disease peculiar to rabbits which would destroy them.

BINDER TWINE WEIGHTS.—Members are of opinion that farmers should insist on purchasing twine at net weights, as under the present system the purchaser was compelled to pay for a lot of waste, of practically no value, at binder twine price.

FLOUR MILL.—Members were agreed that a flour mill at Port Germein would pay, and could not understand why the many advantages of the district, both in regard to the supply of raw material, the local demand for flour, and the facilities for shipment, had not been availed of by any large milling firm. A proposal is now on foot by which portion of the cost of erecting a mill will be advanced by a firm interested in the trade, the balance to be subscribed by the farmers.

Elbow Hill, November 22.

PRESENT—Messrs. Dunn (chair), Ward, Elleway, Harvey, Spence, and Wills (Hon. Sec.), and four visitors.

FIELD TRIAL.—It was decided to arrange for a field trial of cultivators, ploughs, and drills in this district next season. Some discussion took place on the value of the paring plough for stiff land. Most of the members considered the old class of ploughs preferable, as the paring plough left the bottom of the furrow too smooth.

HON. SECRETARY. Mr. H. B. Wills tendered his resignation as Hon. Secretary, as he was leaving the district. Mr. H. Dunn was appointed acting Secretary.

Morgan, November 19.

PRESENT—Messrs. Windebank (chair), Haupt, Hahn, Plummer, Lindner, R. and H. Wohling (Hon. Sec.), and two visitors.

RABBITS.—Members reported that owing to the drought there was no prospect of a crop this season in this locality. What little growth there was was being eaten by rabbits and grasshoppers. The Hon. Secretary stated that he was now cutting a crop on a lagoon about twenty miles from Morgan. If he could have left it until ripe he would have reaped fully four bags per acre, but the rabbits were so bad that it was not safe even to leave the sheaves in the field to dry, as the rabbits would climb up the stooks and eat off all the heads. Mr. Hahn recommended the use of phosphorised pollard. After considerable discussion it was resolved that this Branch views with alarm the increase of rabbits in this district, and is surprised that the authorities are taking no action to enforce the laws relating to the destruction of rabbits.

Watervale, November 21.

PRESENT—Messrs. Sobels (chair), Treloar, Scovell, Ashton, Holder, Perin, and Castine (Hon. Sec.).

PROTECTION AGAINST FROST.—The Chairman read a paper on the protection of vineyards against damage by frost. He strongly advised general action by the vignerons to protect their vineyards by means of a dense cloud of smoke on frosty mornings. Preparations must be made beforehand, so that fires can be lit whenever the temperature reaches danger point.

Wilson, November 19.

PRESENT—Messrs. Harrison (chair), Nelson, Ward, Meyer, Sexton, Hilder, Crossman, and Neal (Hon. Sec.).

POULTRY.—Discussion on poultry for the farm took place. Mr. Meyer favoured the Brown Leghorn and Silver Wyandotte; they were both hardy and good layers. Most of the members advocated the Minorca-Langshan cross as good, all-round birds for the farm. August was considered the best month to rear chickens in this locality. Tick is the greatest drawback to poultry in this district. It is impossible to combat this pest unless the fowl-houses are built of some other material than wood.

Morchard, November 19.

PRESENT—Messrs. Scriven (chair), Kirkland, O'Loughlin, Kupke, Bull, Martin, Kitto, Toop, Barrie, and Beck (Hon. Sec.), and two visitors.

GRAIN THRESHING.—Mr. Kitto read a paper on this subject. He thought every farmer in the dry districts should cut a portion of his crop each year and thresh it, in order to provide a good stack of straw. He thought the grain ripened in the stooks made a better sample than if left for stripping. Wheats that shed freely should not be cut for threshing. King's Early and Early Para were two of the best kinds for this district. He preferred the threshers to the header, as it took out all the grain, cleaned out the dust, and softened the straw. To minimise the expense of working a threshers he suggested that several farmers should combine and help one another with the work. To illustrate his remarks, Mr. Kitto showed wheat ready for threshing, the grain and the straw after treatment, and also the straw chaffed for feeding. Mr. Kupke tabled sample of Medeah wheat.

Koppio, November 17.

PRESENT—Messrs. Gardiner (chair), A. and D. Howard, Jacobs, Roberts, Newell, Swinburne, and Brenmand (Hon. Sec.), and eight visitors.

FALLOWING.—Mr. Roberts read a paper on working fallow land. He advocated commencing fallowing operations directly after seeding, as in nine years out of ten early fallow gave better results than late fallow. The depth to plough must be the first consideration, but no hard-and-fast rule can be laid down. Every farmer must use his own judgment, as the nature of the soil is the main factor. He would, however, plough deeper in the early part of the season than later. He advised harrowing the land as ploughing proceeds, to break up the furrows and prevent the land from baking; where possible cross-harrow. After the rubbish has got a good start, keep the cultivator or scarifier going. This destroys the weeds, makes a good seedbed, and conserves the moisture. He would use the harrows on any land that had not worked down well. They could not work their land too much at the right time, i.e., when moist; dry working of fallow land must be avoided. This was the system he had followed with success in the Lower North. Members generally agreed with Mr. Roberts. Several had tried late fallowing, but it had not been a success. A long discussion on harrowing took place. Most members agreed that it was better to harrow ahead of the drill than after, except where the drill had failed to bury the seed.

Cherry Gardens, November 8.

PRESENT—Messrs. Burpee (chair), Jacobs, Hicks, Matthews, and Ricks (Hon. Sec.), and one visitor.

BUSINESS.—Rabbits were reported to be increasing very fast in this district and doing much mischief. Mr. Jacobs reported on proceedings of Conference at Woodside.

Bowhill, November 23.

PRESENT—Messrs. Norman (chair), Whitfield, Johnson, E. and A. Weyland, Fisher, J. Waters, and J. Waters, jun. (Hon. Sec.), and one visitor.

POULTRY COMPLAINT.—Mr. Johnson reported that his fowls were suffering from some complaint. The young birds became weak in the legs and crippled. A decoction made from mallee leaves was recommended.

WHEAT.—Mr. Weyland reported that his wheat was ripening very unevenly. His best crop this year was White Tuscan, sown during the last week in April and manured with about 56 lb. mineral super per acre. Mr. Waters spoke well of this variety, and highly recommended it for hay; it did not appear to suffer from rust. Marshall's No. 3 was recommended by Mr. Johnson.

Arden Vale, November 21.

PRESENT—Messrs. Warren (chair), Eckert, Fricker, Miller, Schuttloffel, W. and J. Willis, Klingberg, Liebich, Starr, and Hannemann (Hon. Sec.), and about 100 visitors.

ANNUAL MEETING.—This being the annual harvest meeting, proceedings were mainly of a social character, music, singing, etc., being indulged in. The Chairman and Hon. Secretary both spoke of the value of these special gatherings. The usefulness of the Bureau meetings generally was also referred to. Mr. Searle gave an address on combination amongst farmers.

Clare, November 18.

PRESENT—Messrs. Birks (chair), Kelly, Jarman, Knappstein, Kimber, Dolan, Dall, and one visitor.

HON. SECRETARY.—Mr. J. Dall was appointed Hon. Secretary during the absence of Mr. H. H. Greenway, who was granted six months' leave of absence.

PHYLLXERA-RESISTANT STOCKS.—Mr. T. Dolan read a paper on the working of vines on phylloxera-resistant stocks. Under the usual system the cost of establishing a vineyard on resistant stocks was very great, and several years were lost before the vineyard came into bearing again. The resistant vines required to be four years of age if planted on the site of the old vineyard before they were strong enough to be grafted over, and another four years would elapse before much return could be expected from the vines. Instead, therefore, of removing the old vines, he suggested they should be cut down and grafted over to resistant scions, putting in the grafts as deep as possible. Each scion should consist of one node, and with an average season, having the help of the old vines, these grafts would make strong growth, and the following season could be re-worked with the variety desired. By this means the vineyard could be brought into full bearing in about three years. The reason he advised deep grafting and the use of only one node was that there should be enough covering ground for the second grafting without too much mounding up. The resistant scions worked on the original stocks would throw out vigorous roots and would make satisfactory growth for the second grafting. A vigneron in South Africa to whom he had suggested this method had written him recently that he had tried the experiment and found it very satisfactory.

Clarendon, November 21.

PRESENT—Messrs. Spencer (chair), Phelps, Juers, Dunmill, Pelling, J. and P. Piggott, Harper, and Wright (Hon. Sec.), and two visitors.

POULTRY.—Members paid a visit of inspection to Mr. W. L. Williams's Sunnyhurst Egg Farm, Baker's Gully, and a very interesting time was spent inspecting the fowls, incubators, brooders, etc. The splendid record of Mr. Williams's Leghorns at the Roseworthy competition gave added interest to the visit.

CASTRATING COLTS.—Some discussion took place on the best age at which to castrate colts. Most members favoured the operation when young, as there was less risk then than later on.

CUTTING HAY.—Members generally thought hay should be cut after the grain had formed, but as green as possible.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Dec. 21	Jan. 18	Millicent ..	Dec. 1	Jan. 5
Balaklava ..	—	14	Minlaton ..	10	7
Booleroo Centre ..	20	17	Morchard ..	17	—
Bowhill ..	—	Feb. 4	Morgan ..	17	—
Brinkworth ..	2	Jan. 6	Mount Pleasant ..	—	Mar. 3
Burra ..	16	20	Mount Remarkable ..	22	—
Cherry Gardens ..	13	10	Mundoora ..	23	—
Clare ..	23	20	Nantawarra ..	21	Jan. 18
Colton ..	3	7	Naracoorte ..	10	14
Crystal Brook ..	—	14	Norton's Summit ..	23	20
Eudunda ..	19	—	Onetree Hill ..	22	19
Finniss ..	5	2	Penola ..	10	14
Forest Range ..	22	19	Pine Forest ..	20	17
Forster ..	3	—	Port Broughton ..	17	19
Gladstone ..	—	7	Port Elliot ..	17	21
Golden Grove ..	22	19	Port Lincoln ..	17	21
Hartley ..	23	—	Reeves Plains ..	—	20
Inkerman ..	20	—	Riverton ..	17	21
Johnsburg ..	17	—	Saddleworth ..	16	—
Kanmantoo ..	23	20	Stansbury ..	3	—
Kapunda ..	23	—	Stockport ..	19	—
Kingscote ..	—	9	Strathalbyn ..	26	30
Kingston ..	31	28	Utera Plains ..	17	21
Koolunga ..	15	19	Virginia ..	19	16
Longwood ..	24	21	Watervale ..	19	—
Maitland ..	3	7	Whyte-Yarcowie ..	17	21
Mallala ..	—	9	Willunga ..	3	7
Mannum ..	17	21	Wilmington ..	21	18
Meningie ..	10	14	Woolundunga ..	10	14

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from October 27 to November 26, 1904.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	104	130	359
Masons and bricklayers	—	—	2
Carpenters	1	4	1
Painters	3	—	23
Blacksmiths and strikers	3	—	2
Fitters and turners	4	1	1
Plumbers and ironworkers	—	1	1
Brassfinishers	1	—	1
Cook and sculleryman	4	—	1
Warder	1	—	—
Apprentices	17	3	1
Cleaners	—	2	2
Rivet boys	3	—	—
Porters and junior porters	9	5	2
Totals	150	146	396

November 29, 1904.

A. RICHARDSON, Bureau Clerk.

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VOL. VIII.

THE "BROWN OR BITTER PITTING" DEFECT IN APPLES.

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

At the present time this is the most serious trouble with which our apple-growers have to contend in the production of first-class fruits. One by one the pestiferous troubles of former times, such as the American or woolly blight, *Fusicladium* or black spot, and codlin moth, have yielded to the efforts of patient research and experimental treatment, until to-day they have no terrors for the grower who is willing to apply in an intelligent manner what are now recognised as well-proved remedies and methods of prevention.

The first step in grappling with any plant disease is now universally recognised to take the direction of clearly establishing its position in the realm of Nature. The time for basing remedial treatment upon outward symptoms only has gone by. Having arrived at the first conclusion, the next movement naturally turns to tracing out its life history, for therein is invariably revealed the stage of its existence when it is most vulnerable. Up to the present the diseases of our fruit trees have, with few exceptions, been traced to the actions of insects, fungi, or bacteria. The life history of each such organism has been gradually, but firmly, established, chiefly owing to the researches of scientific men. The disease, however, forming the subject of this article has thus far eluded all attempts to place its cause at the door of any living organism.

It is beyond the powers of the writer to enter into those realms of investigation which cover the fields exploited by the mycologist, bacteriologist, or highly scientific entomologist; but it is his wish to bring forward some of those simple observations—made chiefly in the orchards of this State—such as often prove of very great assistance to the deeply scientific in their more exact researches.

The early history of this defect is somewhat obscure. The writer can cast back an intelligent recollection of South Australian grown apples for upwards of 25 years; but until more than half of that period is passed in retrospective vision no recollection of the defect is forthcoming. The simultaneous occurrence of the damaged apples with the presence of the gaudy Harlequin fruit bug (*Dindymus versicolor*) induced the writer, like many others, to accept, without further investigation, that insect as the cause. This, like many another similarly founded conclusion, has been cast aside as erroneous. In the light of more careful investigation we find here in our State that one is by no means complementary to the other: but that this insect thrives best under those climatic conditions which appear to be most conducive to the "brown pitting" of the apples. In part I. of his work on "The Destructive Insects of Victoria," published in 1891, but compiled. I

presume, a year or more earlier, Mr. C. French figured this insect in conjunction with an apple fruit bearing the characteristic spots of this disease, and presumably attributes their presence to the depredations of this bug. In the *New South Wales Agricultural Gazette* for December, 1892, Dr. N. A. Cobb referred to this subject in a short note under the heading of "Another Obscure Disease of the Apple," and figured an apple affected with the now well-known "pitting" upon its surface. He, however, with that painstaking exactness which always characterises his researches, more critically examined the specimens, and avoided the error into which the writer confesses to have fallen. He declared that the "pitting" was not caused by the punctures of insects, because microscopic examination failed to disclose evidence of puncture on the skin that could be connected with the spots. Since the publication of the above, many contributions to our knowledge of the disease have appeared in the various Australian official and private journals, dealing with horticulture, from the pens of scientifically trained men, as well as from commercial orchardists.

In *The Journal of Agriculture* for September, 1904, published by the Victorian Department of Agriculture, Mr. McAlpine, the Government Vegetable Pathologist, quotes Dr. Bull, the Bacteriologist at the Melbourne University, to show that after careful and prolonged testing the "pitting" was not, in his opinion, due to either fungus or bacterial agencies. Dr. Bull further points out that the apples had been kept for four months in a cool room; but the original "pitting" disease had not progressed. (The so-called "cool room" is stated to have registered a temperature of from 32 to 45 degs. centigrade; but as this represents 89.3 to 113 degs. F., I suspect an error has been made in printing Dr. Bull's report, as the above temperatures would practically destroy apples in a very short time.)

Although it may be premature to assume that organised bodies are not in any direct way concerned in the production of this diseased condition, the weight of evidence at present points to other causes more generally connected with the nutrition or formation of the cells in the pulp of the fruit. The combined presence of much moisture and high temperatures appear to be predisposing in their influences. The outward indications of the pitting often appear at first in the form of small, dark-green, depressed areas on the skin. These are usually on the lower end of, or half of, the fruit as it hangs in a natural position on the tree, and they are frequently more noticeable on the under or inner side of the apple, i.e., the face nearest to the tree stem. Sometimes, however, the first evidence consists of small, slightly reddened areas, showing scarcely any depression. Beneath these areas the pulp cells are of a dull, brown, dry, spongy nature, quite collapsed and dead, for several layers in depth. Owing to the skin remaining intact, these atrophied cells are apparently preserved from the action of decomposing organisms from without. The worst characteristic of the disease is that these outward evidences are sometimes absolutely wanting, and the packer for export or long-keeping in store finds later on that as the normal pulp ripens the pitting develops, and renders the fruits absolutely useless. When an affected fruit is dissected, these dead areas are found in an apparently disconnected arrangement throughout the normal pulp, from beneath the skin to the walls of the carpellary cavities. The most noticeable development of the pitting seems to follow the formation of sugar as the apple approaches what is known as ripeness.

It would be interesting to know the chemical changes which ensue during the progress of the processes of growth of apple fruits not liable to the defect, as representing the normal side, and of fruits at similar stages from trees liable to the disease. That some radical difference takes place towards the end of the growing stage is indicated by the fact that tests in picking and storing specimens of sorts very susceptible to the disease at various stages of growth gave diverse results. Those fruits which were sufficiently immature to shrivel did not develop any pitting; those gathered from the same trees when fully grown developed it to a ruinous extent. I can discover no record of the presence of the defect outside Australasian horticultural literature, and some specimens sent a few seasons ago by Mr. A. B. Robin, of Nuriootpa, to the United States Department of Agriculture could not be identified by the officers of the Division of Pathology, who, strangely to my mind, attributed the "pitting" to the effects of drops of moisture which had fallen and dried upon the skin.

The following table will show the comparative immunity of the varieties commonly met with in South Australian orchards, so far as my observations extend:—

BADLY AFFECTED.	MODERATELY AFFECTED.	SELDOM AFFECTED.	NEVER AFFECTED.
Cleopatra, or New York Pippin	Dumelow's Seedling	Adam's Pearmain	Dunn's Seedling
Esopus Spitzenburgh	Cornish Aromatic	Buncombe	London Pippin
Northern Spy	Jonathan	Morgan's Seedling	Rome Beauty
Hoover	Lady Henniker	Nickajack	Rokewood
Baldwin	Maiden's Blush	Reinette du Canada	Stone Pippin
Scarlet Nonpareil	Cox's Orange Pippin	Rymer	
Ribston Pippin	Prince Bismarck	Shockley	
Garibaldi	Shepherd's Perfection	New Town Pippin	
	Winter Majetin	Strawberry Pippin	
	Sturmer Pippin	Dougherty	

The positions of the varieties in these lists may be subject to slight alterations, but they are arranged here according to observations made by myself over all parts of the State. The absence of the names of the early summer ripening varieties—the Ribston Pippin being about the earliest, which would not ripen before February—is a noticeable feature. Amongst those subject to very bad infection, the Cleopatra, or New York Pippin, is generally considered to be the most injured. This may not be correct, if based upon a calculation made from an even number of fruits or trees of the varieties set down in our first list; but as this variety is much more largely planted than any other, the losses in the aggregate are more conspicuous. In the column representing those only "moderately affected," there are some sorts which, excepting under damp conditions, are rarely affected. In the section described as "seldom affected," the majority of growers would doubtless call them safe from the disease. Those in the final section are, as far as I can recall, perfectly free, even when grown under the conditions which observation would pronounce to be predisposing to the defect. I should not, however, be surprised to hear that apples of Rome Beauty or London Pippin have been found occasionally affected by the pitting. This suspicion is based upon their comparatively soft pulp.

Wherever the varieties which are known to produce fruits showing this diseased condition are planted in soils of a very rich character, or if only moderately rich, then abundantly supplied with moisture, thereon the diseased fruits are found. Again, wherever under conditions approximating to the above these varieties are subjected to hard winter pruning, which in turn results in the pushing out of rank, succulent growth, thereon the large sappy fruits, the defect is noticeable. I have frequently observed instances of the "pitting" following upon such pruning in the Lower North, where the soil was neither rich nor particularly retentive of moisture, and where the annual rainfall barely exceeded 20 inches. This occurred chiefly in cases when the trees had broken down with the weight of the crop, and had been cut back during the following winter to the secondary arms. As far as I could ascertain the superabundant crop which caused the breakage consisted of apples below the normal size, and they were not pitted to any appreciable degree. Respecting the effect of soil moisture, instances are recorded from the Angaston district—which has a rainfall of about 23 inches per annum—where thunder showers which fell in February had collected in hollows and soaked the area occupied by the roots of certain trees only in the orchard. Owing to this unseasonable irrigation, these particular trees put on distinctly fresher, deep-green foliage, and produced a much greater proportion of large apples than the other trees in the plantation. These large fruits were badly affected by the "pitting" disease, whilst those produced by the trees in the same rows, but standing on dry ground, were practically free from the disease. The fact that the defect is much more prevalent in sorts liable to its injury when they are planted in the wet districts, where the rainfall ranges from 28 to 40 inches per year, is now so thoroughly demonstrated that planters of late years have begun to restrict the numbers

of those varieties in such localities. Unfortunately, by doing so they are compelled to discard several of the very best varieties which have been proved highly profitable, both for oversea export and late keeping for the local markets.

As will be gathered from the foregoing statements, this diseased condition is not confined to apples grown in South Australia. It would be most interesting to know something respecting the soil, rainfall, and temperature where it is most injurious in Victoria and New South Wales. Complaints of its presence have been heard from Tasmania. During a fairly extensive series of observations made in the orchard districts of Southern Tasmania last April, I failed to note its presence, although it would be folly to declare it was not in the orchards visited. Of this, however, I am certain, that in no part of our State could the Scarlet Nonpareil apple fruits be grown to the size attained in the Derwent Valley under irrigation, or in the moist soils as found abutting on to the Huon River, without quite two-thirds of the fruits becoming utterly useless, owing to the results of this defect. I looked for its presence in the few New York Pippins still upon the trees and in the markets, and although many of these far outclassed our largest specimens of the same variety, no "pitting" was seen. Sturmer Pippins, large and juicy, grown on young, vigorous trees, aided by irrigation, showed no outward evidence of being affected.

If, as heretofore stated, the cause of this disease is as yet veiled in obscurity, we may be pardoned if, from the foregoing observations, we postulate, for the sake of suggesting different lines for investigation, several probable theories respecting its origin. Assuming that this pathological condition be due to physiological or morphological defects, the following causes may be put forward:—

- (1) The unsuitable conditions of soil, moisture, and temperature, either separately or in combination, under which the tree exists.
- (2) Fundamental differences in the—
 - (a) Constitution or texture of the tissues of the fruits of the different varieties.
 - (b) Defects transferred or perpetuated by propagation methods.

In setting up the first hypothesis we have a certain amount of evidence, founded, it is true, upon observation. In this State the Cleopatra, or New York Pippin, may be grown on dry, well-drained land, say with a rainfall of 20 inches per annum, which falls between April and Christmas, and where the shade temperature ranges between 70 and 105 degs. F. during October, November, December, January, February, and March, and the disease is not particularly injurious. If, however, irrigation be introduced, and the trees are caused to grow vigorously, and to produce fruits large and attractive, then the defect appears to a disastrous extent. If planted in the wet districts in deep gully lands, with summer shade temperatures ranging from 70 to 75 degs. F. in the daytime, the trees grow rankly, and produce fruits in keeping therewith, and often 50 to 75 per cent. of them are valueless, owing to "bitter pitting." Similar results occur here with the Scarlet Nonpareil, with the exception that in hot, dry districts the fruits degenerate into useless pigmy specimens; whereas in Tasmania, with a lower summer temperature and abundance of moisture, this fruit reaches handsome proportions. To what causes can these diverse results be attributed? One may say either the constituents of the soils vary, or the lower temperature, or both combined, effect these strongly contrasted results. The fallacy or otherwise of our first proposition may be tested by effectively underdraining the land, or by the addition of various manures to it. Such experimental courses should be followed both separately and conjointly over different blocks of trees composed of one variety. These should also be growing in soils as exactly similar as can be found. Such tests to be of value must extend over about five years, if reliable data is to be obtained. It is a well-known fact that the disease is less prevalent during some seasons than others. I understand a series of tests, based somewhat upon these lines, are now in operation in an orchard or two in Victoria.

Under the second proposition, respecting the varying susceptibility or complete immunity of different varieties, an enquiry involving considerable research of a technical character is required to define why these differences should occur. The effects of ordinary culinary operations upon the fruits of

the varieties described as quite immune would point to some important histological difference existing between those of varying degrees of liability to the defect. Although I have not yet been privileged to examine sections of these, I strongly suspect the cell formation will be found to be denser, and the cellulose cell walls to be thicker and tougher, than in those most susceptible. This may be pure conjecture; but the effects of boiling upon the tissues, when the fruits have reached the harvesting stage, certainly point to some such distinction.

Regarding the third proposition, involving the influences exerted by the selection of stock and scion when propagating the apple trees, I am much indebted to a correspondent (Mr. Thos. Fraser, of Orange Grove, near Hectorville, South Australia) for first setting into operation my observations in this direction, as far as "bitter pit" is concerned. During the last 20 years pretty well all of our apple trees have been grafted upon stocks of the well-known Northern Spy variety, for the purpose of averting the ravages of the subterranean form of the American blight, or woolly aphid (*Schizoneura lanigera*). The fruits of the Northern Spy are notoriously affected by the "bitter pit." Again, in the selection of scions, propagators usually take the shoots which are produced upon strong, healthy trees, practically ignoring the presence of any "pitted" fruits that may be upon them. It does not appear feasible to many that such vigorous trees, betraying apparently healthfulness to the highest degree, could transmit this defect to the fruits borne by their progeny. Instances are not wanting locally where the shoot of a grapevine, which has produced a bunch of grapes differing from those on the parent stem, has, when used as scions, passed on the variation to the vines propagated thereby. Again, scions taken from an individual branch known to be a prolific bearer of fruit, is held to transmit this fruiting characteristic to trees raised from scions taken from such a branch. Why, then, should not the tissues, if taken from a Cleopatra which produces fruits affected by "bitter pit," when set on to a Northern Spy or other "pit"-liable stock, continue to produce, or be predisposed to reproduce, that defect when joined together to form a new individual tree? On this side of the subject I again revert to Tasmanian observations. There the seedling stocks are almost in universal use. It is true they are in many respects very badly diseased by American blight, and stunted in consequence. The question arises in one's mind, "Is the comparative absence of the 'bitter pit' in the Tasmanian apples due to the influence of the stock which is not predisposed to it, or does the weakening influence of the suctorial pest, combined with the systems of training adopted there, restrict the vigorous watery growth in the woody as well as the fruity portions of its products, and consequently permit a more perfect elaboration of the crude materials which go to form the tissues of the tree and its fruits?"

It may be added that the Northern Spy is not used to any extent as a stock outside of Australasia, and, as remarked before, the "bitter pitting" defect is not recorded from apple-producing countries situated outside that geographical area. This may be nothing more than a coincidence; but investigation may prove otherwise. Until more exact knowledge of the subject is acquired, the following suggestions may be put into practical operation without departing from the lines of safety:—

- (1) Avoid planting on damp, rich soils those varieties which are known to be susceptible to the disease.
- (2) Underdrain very moist and retentive soils.
- (3) After the tree is framed, refrain from the application of hard winter pruning to strong-growing specimens, and do any necessary pruning during the summer.
- (4) Try the effects, either separately or combined, of lime or artificial fertilisers containing potash and phosphoric acid.
- (5) Try the effects of using a less sappy vigorous stock and one that is known to be practically immune from the disease.
- (6) Select scions for grafting from trees the fruits of which have been thus far free from "bitter pitting."

STOMACH AND BOWEL DISORDERS OF THE HORSE.

By VETERINARY SURGEON DESMOND.

*(Continued from page 263, December, 1904.)***ACUTE INDIGESTION.**

Treatment.—This must vary, according to the conditions that have caused the derangement, viz., dry or green food. If the troubles have been caused through dry food, and no gas is present, a full dose of purging medicine, combined with nux vomica, should be given, followed by chlorodyne. In the choice of a purge, aloes are the best, and, if possible, should be given in the form a ball; while the nux vomica should be given in dram doses of the powder, and chlorodyne in tablespoon doses, dissolved in cold water. It is not advisable to give opium combined with a purge; the opium has a tendency to bind up the bowels, while the aloes are given to unload the digestive system. Laudanum is opium dissolved in spirits of wine. It is like giving a purge with one hand, and in trying to lock up the bowels with the other hand. If the trouble is due to green feed, and gas is present—a condition which, in most cases, we have to contend with—the treatment which gives the best results is carbolie acid and camphor combined, and given in ball form. The dose for a medium-size horse is one dram of carbolie acid, combined with three drams of camphor. Other medicines may be given, as bicarbonate of soda, in ounce doses; aromatic spirits of ammonia in two-ounce doses; and alcohol, such as whisky or brandy, in half-pint doses, diluted with an equal quantity of cold water. If the abovementioned drugs have had the desired effect, it is advisable to follow with a purge. Hot fomentations, kept up for hours, and followed by a stimulating liniment, such as turpentine liniment, are advised; but in this country it is rare to find owners or attendants with perseverance enough to give the necessary attendance to a method of treatment which, to have the desired effect, must be kept up for several hours. If the pulse is bounding in character, and the animal shows symptoms of brain trouble, bleed liberally. It is advisable to remove the blood quickly, and in quantities that will have a marked effect on the pulse. To remove the blood quickly, it is necessary to use the larger-sized fleam—fleams usually have three blades, the small size for a pony, the middle fleam for a horse, and the largest size for a bullock or a draught horse. If the pain continues, try such drugs as chloral hydrate in ounce doses, dissolved in water, or extract of belladonna in dram doses, given in a ball. If these remedies will not control the pain, or if the animal tries to vomit, make sure that there has not been an error in diagnosis.

Post-mortem Appearances.—When one is unfortunate enough to have a death from gastric troubles, and has curiosity and energy enough to make a *post-mortem* examination, the following conditions are usually found:—There are usually three direct causes of death, viz., brain troubles, rupture of the diaphragm (the skirt), and rupture of the stomach. If death has been caused through some affection of the brain, and the examination is made a short time after death, the stomach is usually found intact, but very much engorged with food. The blood vessels are congested, and the blood in them is of a dark colour. This condition also applies to the blood-vessels of the brain. When the stomach is ruptured, it is usual to find the contents scattered among the delicate membrane that surrounds this organ, and the bowels and the delicate membrane supporting the stomach may be ruptured. The rupture of the stomach usually takes place near the entrance of the gullet, or along the floor, or bottom, of this organ. Great care has to be exercised in forming an opinion that rupture of the stomach has been the cause of death. Rupture of the stomach may take place after death. If rupture has taken place before death, we find laceration, with blood in the tissues. If the horse has lived any time after the rupture has taken place, we must be guided by the inflammatory nature of the coats of the stomach. If the rupture has taken place after death, the edges are clean, pale, and with no inflammatory conditions. Rupture of the diaphragm (the skirt or membrane that divides the chest from the bowels) may take place before or after death. The conditions are much the same as in rupture of the stomach. Rupture may take place after death, through the bowels being greatly distended with gas.

AFFECTIONS OF THE INTESTINES.

This affection is, in my opinion, the most common cause of ordinary everyday colic or gripes.

Symptoms.—As in affections of the stomach, the symptoms in the early stages are not those of well-marked pain; the animal is dull, refuses its food, or eats a little at intervals; the pulse, respirations, and temperature are not disturbed at this stage. As time goes on the animal shows more or less pain or uneasiness, such as smelling at the bedding, and walking around the loose-box, or attempting to lie down. In course of time he usually paws, sometimes with the hind legs, and kicks at his belly, puts his nose into the flank, lies down, usually flat on his side, and occasionally brings his head slowly towards his flank, with an anxious expression. There may or may not be gas in the intestines. If present, the symptoms are usually more aggravated. Sweat is found under the flank and in the region of the thighs; the eyes have an anxious look; the animal reels while walking, has laboured breathing, and will, in many cases, throw himself down, instead of, as in health, lying down quietly. Another important symptom of impaction of the colon is walking backwards, which is usually seen when this affection has lasted some time. The pulse at this stage is increased, and the membranes surrounding the eyes are very inflamed. A very common symptom is frequent micturation, the animal voiding a few drops of urine at a time. This frequent passing of urine in small quantities is, in my opinion, caused by the irritation set up in the bowels; it may be caused through pressure on the bladder, or by inflammation of the bowels. The frequent passing of urine in small quantities leads the owner to believe that the horse has bladder or kidney troubles, often termed "water gripes." The veterinary is often asked to treat a horse in which the owner will say, "He is bad in his water, and can make only a few drops at a time." The irritation, or pressure, causes the animal to micturate as often as a few drops of urine are lodged in the bladder. This can be proved by an examination of the rectum, when, if the bladder is full, it will feel like a football under the hand.

Diagnosis.—With derangement of the colon this includes an accumulation of gas and impaction. The diagnosis is not as difficult as in other portions of the digestive organs. First get the history of the case, examine the dung that has been passed, the character of the food, and the manner in which it is given; also the water that is supplied. Next take the pulse, respirations, and the temperature. Note if the pulse is over 60 beats per minute. The pulse of the horse in health is 36 to 40 per minute. The next step is to examine the abdominal cavity with the hands, also the ear, to find out if the sounds proceeding from the intestines in health are present. This is most important, as in impaction of the colon, by placing the ear on the right side behind the last rib the movement of the bowels is almost absent. The next step is to explore the rectum. Give an enema of hot water and soap, noting if the injection brings away any faeces, and if they are hard and coarse, or covered with mucus. Soap the hand and arm, and place in the rectum; remove and note appearance of faeces, if present, and then ascertain the condition the bladder is in. If the bladder contains urine in any quantity, remove it with a catheter, or by steady pressure with the hand through the walls of the rectum. After emptying the bladder, again explore the rectum high up to find out the condition of the colon.

(To be continued.)

RECEIVED

POULTRY NOTES.

By D. F. LAURIE.

As a rule, reports to hand speak of a successful breeding season. A great number of purebred stock, of more or less merit, will be available for distribution next season, which must in time tend to considerably improve the average quality of our poultry. Those who purpose purchasing pure stock for the coming breeding season should not delay too long. As a rule, people wait until the best birds are sold, and then there are only inferior specimens, late-hatched chicks, etc. It is not too soon to start work for next year. All extra yard accommodation should now be put in hand while the days are long. In the cold, wet weather it is not always convenient to do such work, and delays may cause loss. All chicken-coops, brooders, etc., should be overhauled and painted or limewashed, and stowed away carefully.

Very few cases of disease have been reported to me this year. Breeders generally are more experienced, and, by paying more attention to their birds, especially from a sanitary point, will naturally have much less trouble. The better methods of feeding which are adopted nowadays go far to produce better birds. The ill-fed, weakened birds, so often seen, were very prone to diseases of various sorts. About the suburbs, the ordinary house cat seems to give most trouble to breeders; the felines are responsible for the deaths of many thousand chickens yearly. Where one has a favourite cat, it is a good plan to confine it to a roomy house during the chicken-rearing season. It will be found that, if at large, a cat can claw the chicks even when protected by the smallest meshed wire obtainable. I am much afraid we are in danger of foxes, which seem to be making headway. The sheepowner will have to be a help to the poultry-owner. The man who introduced the fox to Australia deserves much condemnation. In parts of Victoria foxes do much damage to the poultry industry. They were quite plentiful at Caulfield, about eight miles from Melbourne, but have been well thinned out now.

During the next few months the growing stock will need careful supervision. Keep the birds growing, but do not unduly force them. Avoid overcrowding, and attend to ventilation of all poultry houses. Provide shelter from the hot sun, and see that the drinking water is kept cool, and well protected from the sun's rays. Examine your stock, and if vermin are present, use a little insect powder, and provide dust baths, to which add some flour of sulphur. It is a good practice to handle the birds at intervals, taking the opportunity of examining the mouth, in case canker makes its appearance. Have a supply of oil 2 parts, kerosine 1 part, and apply to the comb and wattles; also to the shanks, and in the case of chicks, a spot or two at back of head and around the vent will destroy vermin. Keep a supply of fine charcoal—it is an excellent preventive of disease, and readily eaten by laying hens. The chicks may have some in their soft food.

BLACK RUST OR FLAG SMUT OF WHEAT.

For very many years a disease has existed in South Australian wheat crops causing a blackening of the flag, and also, at times, of the sheath and stem of the wheat plant. Plants so attacked usually die, and every year more or less severe losses have been occasioned by the disease, which has always been known here as "black rust." The disease has appeared in crops grown from seed pickled with bluestone solutions, as well as from untreated seed, and it has generally been regarded as unamenable to preventive treatment. About twelve months ago, however, considerable interest was aroused amongst South Australian farmers by the announcement by Mr. D. McAlpine, F.C.S., Vegetable Pathologist to the Victorian Department of Agriculture, that our so-called black rust was really the leaf-smut of wheat—a fungus quite distinct from the true black rust, and running a different course. Mr. McAlpine then suggested that treatment of the seed wheat with formalin would probably prove effective in preventing the disease, and recently he reported on the results of some experiments carried out by himself at Port Fairy and Rutherglen to determine this point. Ordinary seed wheat was taken, and thoroughly infected with the spores of the fungus. Then one-half was taken and treated with formalin, and the other half left untreated, and both treated and untreated were sown alongside of each other on the same day. The treatment consisted in using Schering's formalin at the rate of 1 lb. to 40 galls. of water, and steeping the seed in it for about ten minutes, then allowing it to dry before sowing. The plots were recently inspected, and the results were perfectly satisfactory. About 20 per cent. of the plants in the untreated plot were affected with flag smut, and some of them killed off before producing the ear; while in the treated plot not a single infected plant could be found, although the most careful search was made.

During the past season a number of members of the Agricultural Bureau also tried the effect of formalin on a large scale, and the Department of Agriculture will be glad to hear what their experiences have been. As formalin is quite as effective as bluestone pickle as a preventive of the ordinary smut or bunt of wheat, is equally as cheap, and less injurious to the grain when used at the proper strength, it is more than likely that the discovery that it is also a preventive of the so-called "black rust" will result in its general use in preference to bluestone.

EXPERIMENTS WITH FERTILISERS FOR WHEAT.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

During the past four or five years a considerable number of experiments with fertilisers for wheat and hay crops have been carried out for the Department by members of the Agricultural Bureau. Many valuable lessons have been learned from these experiments; in some districts the results have led to a large local demand for fertilisers. Owing, however, to these experiments having been carried out in different localities each season, they have not been as valuable as they would have been if the same soil was tested for a number of years. What farmers particularly desire to know is, how long will they be able to get satisfactory results from the application of phosphatic manures? Will the land in the course of a few years' manuring with phosphates show the need of either nitrogen or potash?

With the object of throwing some light on this important question, arrangements were made last season to start what we propose shall be continuous experiments with various fertilisers. Several members of the Agricultural Bureau were asked to assist in this matter by setting apart from 6 acres to 10 acres of land for experimental purposes, and Messrs. F. Coleman, of Saddleworth; P. A. Cockburn, of Strathalbyn; and T. Pengilly, of Aldinga, agreed to do so. In the two former localities it was decided that fallow land only should be cropped, and that the plots should be manured as under:—

Plot No. 1—1 cwt. mineral super per acre.

Plot No. 2— $\frac{1}{2}$ cwt. nitrate of soda per acre.

Plot No. 3—1 cwt. mineral super, $\frac{1}{2}$ cwt. sulphate of potash, and $\frac{1}{2}$ cwt. nitrate of soda per acre.

Plot No. 4— $\frac{1}{2}$ cwt. sulphate of potash per acre.

Plot No. 5—No manure.

Plot No. 6—1 cwt. mineral super and $\frac{1}{2}$ cwt. sulphate of potash per acre.

Plot No. 7— $\frac{1}{2}$ cwt. sulphate of potash and $\frac{1}{2}$ cwt. nitrate of soda per acre.

Plot No. 8—1 cwt. mineral super and $\frac{1}{2}$ cwt. nitrate of soda per acre.

As will be seen, the object of these experiments is to test the value year after year of the effects of the application of a complete fertiliser (No. 3), and of fertilisers containing only one or two of the principal plant foods. The no-manure plot is for general comparison.

Each of these plots is exactly half an acre in area, viz., 242 yards long by 10 yards wide. Next season a similar series of tests will be undertaken on a 5-acre block immediately adjoining, and the land just cropped will be fallowed. The following season this block will be again manured in the same way as it was for the 1904 crop.

The following is the report on results obtained at

TUELA, SADDLEWORTH (MR. F. COLEMAN).

Land, a stiff, black, Bay of Biscay soil, which cracks badly in the summer. Plots on a hill, with a gentle incline to the south; elevation, about 1,180 feet above sea level. The following is the history of the land since it came into the possession of the present occupier:—

1899—Cropped with wheat, and manured with 1 cwt. bone super per acre.

1900—1—Fallow; sorghum planted on fallow, and fed down by sheep.

1901—Wheat crop, unmanured, cut for hay.

1902—In grass; grazed by sheep.

1903—Fallowed in July, harrowed and scarified during the spring.

1904—Scarified in January after summer rains; scarified again in April, and seed sown with drill on May 5.

Majestic wheat, one of Mr. R. Marshall's rust-resistant varieties, was sown at rate of 76 lb. per acre. The superphosphate was drilled in with the seed, but the nitrate and potash were drilled in separately. The average rainfall of this district is practically 20 inches; but the past season has been a very dry one. The rainfall for the first three months of the year totalled 3.49 inches, and the fall each month since has been:—April, 0.84 in.; May,

0.98 in.; June, 1.88 in.; July, 1.78 in.; August, 1.30 in.; September, 0.47 in.; October, 1.79 in.; November, 0.49 in.; December, to 13th, nil. Total—From April to harvest, 9.53 in.; and for year, 13.02 in. It will be seen that April, May, September, and November were unusually dry, while the rainfall during the winter months was also below the average for the district.

Samples of soil (first 6 in.) and subsoil (second 6 in.) were taken from different parts of the plots, and a fair average of each obtained for analysis. Mr. W. S. Chapman, School of Mines Analyst, reports as follows:—

SADDLEWORTH SOIL ANALYSIS.

	Soil. per cent.	Subsoil. per cent.
Fine earth (i.e., passed through 1/30 in. sieve) ...	99.00	99.50
Moisture in fine earth at 105 deg. C. ...	7.50	8.06
Organic carbon	1.01	0.78
Total nitrogen	0.106	0.071
Total phosphoric acid	0.048	0.041
Potash soluble in strong hydrochloric acid ...	1.13	1.20
Lime soluble in cold, dilute hydrochloric acid ...	1.93	2.79

This soil may be regarded as fairly rich in nitrogen, rich in potash, above the average South Australian soil in phosphoric acid, but below it in lime.

RESULTS OF EXPERIMENT.

The following table shows the results of the 1904 harvest:—

No. of Plot.	How Manured.	Yield per Acre.	
		bus.	lbs.
1	1 cwt. per acre Mineral Super	25	44
2	$\frac{1}{2}$ cwt. per acre Nitrate of Soda	15	52
3	1 cwt. Mineral Super, $\frac{1}{2}$ cwt. Sulphate of Potash, and $\frac{1}{2}$ cwt. Nitrate of Soda	25	24
4	$\frac{1}{2}$ cwt. Sulphate of Potash per acre	15	50
5	No Manure	16	14
6	1 cwt. Mineral Super, $\frac{1}{2}$ cwt. Sulphate of Potash per acre	24	38
7	1 cwt. Sulphate of Potash and 1 cwt. Nitrate of Soda per acre	15	56
8	1 cwt. Mineral Super and $\frac{1}{2}$ cwt. Nitrate of Soda per acre	24	28

Owing to a mistake, Plot 7 received twice as much manure as was intended. The mineral super was a brand containing 39 per cent. to 42 per cent. water-soluble phosphate.

The high yields of Plots 1, 3, 6, and 8, in the face of the small rainfall, is eloquent testimony to the care and intelligence displayed by Mr. Coleman in the cultivation of his land. It will be noticed that the plot receiving mineral super gave the best result, viz., 20 lb. per acre over the complete manure, 1 bus. 6 lb. per acre more than Plot 6, and 1 bush. 16 lb. more than Plot 8. It will also be noticed that the unmanured plot gave a better return than the plots receiving nitrate of soda or sulphate of potash, or both. It would almost seem that these manures have actually had an injurious effect. Allowance must be made for the variations in yield which occur in every paddock, and which it is impossible to guard against. At the same time, however, I am inclined to think that some of the difference in this instance is due to the effect of the manures. Our previous experience has been that both nitrate of soda and sulphate of potash have a tendency to delay the ripening of the grain somewhat. With the very dry weather experienced during the six weeks preceding harvesting, it is quite likely that the wheat on these plots suffered, owing to the crop being not quite so forward as on Plot 1. It will be interesting to note how the Strathalbyn results compare in this connection, and how future results bear out or disprove this opinion.

ALDINGA (MR. T. PENGILLY).

These experiments were undertaken with a view to determining whether in the South, where the rainfall is reliable, fallow cropping could be substituted for bare fallow, with profit to the farmer. The usual system in this district with the best farmers is to crop mostly fallow land. In general, the land is under cereal crop once in two years, or once in three years, and hay is largely grown. With the high price of land in the South, the cost of cultivation, and the heavy expense of hay-carting 20 to 30 miles by road, it seems open to question whether the price realised for the hay crop under average conditions gives the farmer an adequate return for his outlay in cash and labour.

At the request of the Department of Agriculture, Mr. Pengilly has set apart a block of land on which experiments will be carried out for a series of years. Each season one-half the block will be under wheat, manured as indicated below; and the other half under some fallow crop, such as rape, beans, etc. The present season forcibly illustrates the necessity for carrying on these experiments for a number of years, if anything of permanent value is to be gained. The land devoted to the experiments is a stiff, black loam, on the lower slope of a rather sandy elevation, facing due north. This land has been grazed for about 18 years; it was ploughed up in May, 1904, to a depth of 5 to 6 inches; rolled at once, to secure a firm seedbed; harrowed well, and cultivated before being sown, in order to break the crust formed after heavy rains, and to secure a fine tilth. In order to facilitate harvesting operations, the plots were 10 yards wide by 242 yards long—half an acre in area—separated by strips 14 feet in width. On these strips, and at each end, brown field peas were sown, a patch 2 feet in width being left around each plot. The peas were manured with 1 cwt. mineral super, and yielded about 30 bushels per acre.

Average samples of the soil (first 6 inches) and the subsoil (second 6 inches) were obtained for analysis, the results of which are given hereunder:—

ANALYSIS OF ALDINGA SOIL.

	Soil. per cent.	Subsoil. per cent.
Fine earth	98.60	98.70
Moisture in fine earth at 105 deg. C.	6.45	2.65
Organic carbon	1.23	1.70
Total nitrogen	0.127	0.140
Total phosphoric acid	0.037	0.033
Potash soluble in strong hydrochloric acid	1.35	0.64
Lime soluble in cold, dilute hydrochloric acid	0.59	0.42

This soil is therefore rich in both nitrogen and potash, equal to the average South Australian soil in phosphoric acid, but low in lime content. Locally the soil is classed as good, and the above figures bear out this verdict.

On the wheat plots Gallant wheat—a good rust-resisting variety—was sown on May 27, at the rate of 60 lb. per acre. The superphosphate was sown with the seed; the nitrate of soda and sulphate of ammonia were broadcasted on the respective plots immediately after seeding, and harrowed in. All the plots were harrowed after the drill. The following table gives the results of the harvest:—

HARVEST RESULTS, ALDINGA PLOTS.

No. of Plot.	Manured with	Yield per Acre of Grain and Straw.	Yield per Acre of Grain.
		tons. cwt. qrs.	bus. lbs.
1	112 lbs. Mineral Super per acre	2 14 0	20 56
2	112 lbs. Mineral Super { per } 56 lbs. Sulphate of Ammonia { acre }	2 19 3½	22 40
3	No Manure	2 14 0	22 14
4	112 lbs. Super } 70 lbs. Nitrate of Soda } per acre	2 15 2½	23 37

The superphosphate used contained 36-38 per cent. water-soluble phosphate; 70 lb. nitrate of soda contains the same quantity of nitrogen as 56 lb. sulphate of ammonia.

The rainfall recorded at Aldinga from January 1 to harvesting was 22 inches, of which nearly 7½ inches fell before May 1. June, July, and August were very wet and cold, and the crops in the district generally suffered severely; September was unusually dry; October dry for the first half, but fair rains fell later, and improved the crops wonderfully; November was very dry. A strong, hot wind on October 18 seriously affected the results; the manured crops were more forward than the unmanured wheat, and being just out in head were blighted at the tip. Plot No. 2 suffered most in this respect; but in each of the three plots a large proportion of the heads for half an inch or more from the top were without grain. The unmanured plot was scarcely injured, and received the full benefit of the rain which fell soon afterwards. Under the circumstances, no comparison can be drawn between the yields of the various plots. It will be noticed that the no-manure plot yielded the same gross weight of grain and straw, but more grain than the plot receiving 1 cwt. of superphosphate per acre. This, I think, is due to injury caused to Plot 1 by the storm, and also to the fact that the straw on the no-manure plot being not quite so dry was relatively heavier than the other. The crop was harvested with the binder, stooked on the plots to ripen, and afterwards threshed with a header. The high yield from the unmanured land must be very satisfactory to Mr. Pengilly.

On the half of the block to be cropped with wheat in 1905 rape was sown with 1 cwt. of mineral super per acre. Seed was sown too late in the season to expect the best results; still Mr. Pengilly reports the plant made satisfactory growth, and afforded good feed for his sheep. He considers that, in spite of the adverse conditions, the crop was profitable. During the coming season the plots sown to wheat in 1904 will be ploughed up as soon as wet enough, and sown with rape. As the whole of the block will be under rape, it will afford an opportunity of noting whether any marked benefit is derived by the rape from the pea crop that preceded it.

(To be continued.)

AGRICULTURAL BUREAU CONFERENCES.

During February and March most of the Annual Conferences of the Agricultural Bureau will be held. Last year's experiences in connection with these Conferences were not satisfactory. At several the attendance outside the members of the Branch arranging the Conference was exceedingly poor, the consequence being that the meetings were far from successful. As the object of these annual gatherings is to afford members an opportunity for a wider exchange of views than is possible to obtain at the ordinary Bureau meetings, it is evident that, unless the members of the Branches avail themselves of such opportunities it is useless going to the trouble and expense involved in holding them.

We would, therefore, earnestly appeal to all members to heartily support the Branches upon whom devolves the responsibility of arranging the Conferences. Not only should members make a point of being present, but they should also try to induce other farmers to attend. It has been very noticeable of late that comparatively few farmers attend from the locality where the Conference is being held. Members should do their best to remedy this in the future.

So far Port Pirie and Naracoorte are the only Branches which have moved in their respective localities in arranging for Conferences. The Hon. Secretaries of the respective Branches should be advised at an early date of papers proposed to be read. Papers should always be of a practical nature, and be as concise as possible. Lengthy papers, especially on subjects outside the practical work of the farm, are almost invariably a failure.

DEPARTMENTAL NOTES.

In the Executive Council on Thursday, December 29, Mr. W. Angus, B.Sc., was formally appointed Professor of Agriculture and Secretary to the Minister controlling Agriculture. The Treasurer (Hon. R. Butler) stated that Mr. Angus had been appointed Secretary to the Minister, a position formerly held by Professor Perkins, the duties of which have been temporarily carried out by the Under-Treasurer (Mr. T. Gill, I.S.O.). Mr. Angus will be the channel of communication to the Minister from the various Departments connected with agriculture. He will not live at the College, but will deliver lectures there to the students. He will spend a great deal of his time visiting country districts, making himself acquainted with the different conditions existing in the various parts of the State, meeting farmers, and addressing the various branch Bureaus. Now that Professor Perkins fills the post of Principal of the College, Mr. Angus will be much freer to travel about than was the case with his predecessors. He will have charge, under the Minister, of *The Journal of Agriculture*, to which he will be a contributor. Mr. Angus will sign an agreement to remain here for three years.

Recently, at the request of the Council of Agriculture, the Hon. Minister of Agriculture, in conjunction with the New South Wales Department, decided to make joint representations to the Victorian Government, with a view to securing a modification on the present restrictions on the importation of poultry into Victoria from New South Wales and South Australia. The Minister of Agriculture for Victoria has, however, declined to accede to this request.

On Wednesday, December 21, the Corn-Trade Section of the Chamber of Commerce met to fix the f.a.q. standard for the 1904-5 wheat harvest. In accordance with the invitation extended to the Agricultural Bureau by the representatives of the Chamber of Commerce, who attended Congress meetings last September, Messrs. R. Marshall and J. Miller, members of the Council of Agriculture, attended as representatives of the Bureau. Between 30 and 40 samples of the new season's wheat, from parcels bought in the open market without deduction, were the basis upon which the members decided upon the present year's standard, which was fixed at 63 lb. Since 1888 the standard has ten times been fixed at 63 lb. to the Imperial bushel, twice at 64 lb., three times at 62 lb., twice at 62½ lb., and once at 61½ lb.

During December the Inspector of Fertilisers visited Aldinga, Saddleworth, and Strathalbyn for the purpose of inspecting the wheat crops on the experimental plots. He also visited Piccadilly, where some experiments with manures for potatoes are being carried out, and Fulham, where arrangements have been made to test the effect of commercial fertilisers on the lucerne fields.

During the month ending December 26 the Inspectors under the Vine, Fruit, and Vegetable Protection Act admitted 7,336 bushels of fruits and 43 parcels of plants. The fruits consisted of tropically raised bananas, pine-apples, tomatoes, and cucumbers, from Queensland; and 25 cases of Missouri Pippin apples from California. The latter are of the nature of a novelty here at this season of the year, and aroused considerable interest among the dealers. The fruits showed occasional evidences of codlin moth attack, but otherwise appeared to be in good order. There should be a fair demand for a limited quantity of apples of good quality landed here in December, before our own are ready to gather.

The exports during December to Victoria and New South Wales consisted of 8,462 bushels of fruits, made up almost entirely of 15 distinct kinds of fruits which were locally grown. This ranged from the Alpine-loving strawberry to the semi-tropical orange. Vegetables were exported to the extent of about 3,961 packages, and plants to 24 parcels. These figures do not include the hundreds of tons of fruits exported to Western Australia during the month. The rejects amounted to 274 bushels of over-ripe bananas, and 3 parcels of plants which came without the necessary declaration respecting their origin.

During December Mr. Quinn has visited orchards at Marion, and given instructions and demonstrations in the summer pruning of apricot and peach trees. Besides carrying on his usual work at the Agricultural College at Roseworthy, he has conducted the annual examination in fruit culture in connection with the class carried on under the auspices of the School of Mines and Industries in Adelaide.

From October 27 to December 14 Inspector Kelly paid 260 visits to orchards and gardens during the 21 days he has been engaged in the Clare and surrounding districts for the purpose of seeing that precautions were undertaken to keep the codlin moth pest in subjection. He reports a considerable decline in the attention paid to this pest since the inspection ceased in 1902, more especially in the small gardens around the townships, where the return from the trees does not warrant the expenditure which is incurred by spraying. The commercial apple-growers, however, show considerable anxiety in restraining the pest, and naturally resent the neglect of those who do not depend on their fruit for a livelihood.

Pigs affected by swine fever were found in the Adelaide Market early in the month of December, and since that date a number of centres of infection have been located by the officers of the Stock Department. In order to prevent the further spread of this disease a quarantine district has been proclaimed, and the following notice issued by the Chief Inspector of Stock:—

QUARANTINE DISTRICT.

Comprising the whole of the Hundreds of ADELAIDE and YATALA, and that PORTION of the Hundred of PORT ADELAIDE south-east of road south-east of Sections 2276, 3067, and 3069, south of Section 118, and south of Swan Alley Creek, to include Torrens Island and Lefevre's Peninsula: together with that PORTION of the Hundred of NOARLUNGA north-west of main South Road, north of road north of Sections 123, 138, 186, 201, and north of the south boundary of Section 242. No swine can be moved within, out of, nor into this District unless permission is obtained from an Inspector or authorised person. Penalty for breach of regulations, from £5 to £100. No pigs will be permitted to be sold in the Adelaide Market until February 1, 1905.

A proclamation has been issued by His Excellency the Governor, prohibiting for twelve months the importation or introduction into South Australia, from Queensland, New South Wales, Victoria, and Western Australia, of swine, or the bones or hair of swine, or any fodder or fittings put on board any vessel for the use of swine.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Tuesday, December 20, 1904, there being present:—Colonel Rowell, C.B. (chairman), Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, A. M. Dawkins, J. Miller, R. Caldwell, T. E. Yelland, R. Marshall, and W. L. Summers (Secretary).

Prior to commencement of business, members were introduced to Mr. W. Angus, B.Sc., the recently-appointed Professor of Agriculture. On behalf of the Council, Colonel Rowell extended a hearty welcome to Mr. Angus, who acknowledged the courtesy extended to him.

The Commissioner of Public Works returned resolution passed at Woodside Conference—"That the Government should be asked to provide better facilities for the handling and carriage of our fruit on the railway"—with a minute by the Railways Commissioner, asking that those who passed the resolution should be a little more definite. Considerable discussion ensued, and, on the motion of Mr. Molineux, it was resolved—"That the Railways Commissioner be informed that the Council has already indicated what improved facilities are needed, and that whereas members do not propose to indicate special cases of rough handling, they believe that the Railways Commissioner had such cases brought under his notice, and in view of the strong feeling that the fruit and other perishable produce is roughly handled, the Commissioner should take steps to prevent such abuses in the future."

Mr. P. H. Suter, Dairy Instructor, attended by request, and a lengthy discussion of a conversational nature on the question of instruction in dairying took place. Mr. Suter said a great deal of the butter made in the State was undoubtedly inferior, and he welcomed the idea of teaching dairymen the principles underlying the successful manufacture of cheese and butter. They wanted more practice and less theory. It was absurd to talk bacteriology to farmers. The best thing was to insist on effective sanitation and early

delivery of the cream. It was hardly practicable to carry dairy appliances around to outlying districts for the purposes of demonstration. The idea of visiting such centres, and talking to the producers, was a capital one. He was anxious to encourage the policy of sending the milk to the factories, where it could be dealt with by skilful men with the necessary appliances. He wanted to discourage the practice of manufacturing butter on the farm, because of the resultant variety of colours, grades, and quality. Uniformity was highly desirable, and he would put forth his best effort to secure that end. He was glad that the Minister of Agriculture had agreed to the erection of a model cheese and dairy house at the Roseworthy Agricultural College, where courses for students would be carried on. He had endeavoured to introduce necessary reforms in the treatment of cream, and where he had detected faults he had devoted special attention to instructional work. In factories where inferior methods were evident he had remained longer, and he proposed to continue that practice in the future with possibly greater vigour. In New South Wales during the slack season the factory managers attended lectures at the Agricultural College for three or six weeks, and the idea was worthy of adoption in South Australia. Personally he was not in love with theoretical lectures, preferring personal supervision and direction. Lectures at different centres could easily be carried out, and probably would do good. The State lost scores of thousands of pounds in consequence of carelessness and indifference in the handling of milk and cream.

Mr. J. F. Scrymgour wrote submitting offer to disclose an alleged remedy for red rust in wheat. The alleged remedy, which consisted of the treatment of the seed with a special patented preparation, was very simple and cheap, and the inventors desired the promise of a substantial reward should official trials of their preparation prove the accuracy of their claims. Members were decidedly sceptical of any treatment of the seed being effective, and on the motion of Mr. Laffer it was resolved that the Council cannot recommend the Minister to take any action in the matter.

The Hon. Minister forwarded, with correspondence from the Agent-General in London, some interesting notes on the London Dairy Show and the Royal Botanic Society's Grand Horticultural Exhibition; also a handsome silver medal awarded by the Royal Botanic Society for a collection of apples, wines, and brandy exhibited by him at the latter show. It was resolved, at the instance of Mr. Miller—"That, in the opinion of the Council of Agriculture, where the State is represented at shows and exhibitions in Great Britain, sufficient notice should be given to the Department to secure a representative collection of produce of high quality, instead of the Agent-General being obliged to purchase such produce as may happen to be available in London at the time."

The following gentlemen were approved as members of the undermentioned Branches:—Mr. Jos. Hancock, Mallala; Mr. Vogt, Kapunda; Mr. R. C. Burgess, Kingscote; Mr. W. H. Gray, Port Broughton; Mr. E. J. Pearce, Whyte-Yarcowie; Mr. H. Whitfield, Bowhill; Mr. Stewart, Clare; Mr. H. O'Sullivan, Morphett Vale; Mr. T. H. Basey, Renmark; Mr. E. W. Wright, Meadows; Mr. W. G. Pryor, Davenport.

Approval was given to the formation of two new Branches of the Agricultural Bureau at Bagster and Penong, with the following gentlemen as members:—Bagster: Messrs. Thos. Freeman, C. Roberts, E. A. Gravestocks, C., F. C., and E. Brown, J. Stiggants, R. Roberts, T. Hayes, W. T. Payne, and G. H. Bassham. Penong: Messrs. R. Smith, A. B. C. Murray, H. A. Weber, F. B. and E. J. Richardson, J. Oats, P. Farrelly, A. Brook, W. Saunders, A. and J. Shiphard, W. J. Sleep, C. Williams, and W. G. Wiseman.

Some discussion took place on the encouragement of the poultry industry, and the injurious effect on the South Australian jam industry owing to the high price of sugar caused by Federal legislation. Mr. Laffer said this matter was of the greatest importance, not only to the jam-makers, but also to the fruitgrowers of South Australia, as the high price of sugar would cripple the export of jam, and thus lessen the demand for fruit.

On motion of Mr. Miller, it was decided that the Minister be asked to allow Veterinary Surgeon Desmond to attend next Council meeting in connection with proposed enquiry into cattle complaint.

Mr. T. E. Yelland asked whether any steps had been taken to give effect to the resolution passed at the previous meeting, requesting the Minister of Agriculture to co-operate with the New South Wales Department in making a joint request to the Victorian Government to modify the poultry tick regulations. The Secretary stated that the authorities in the senior State had agreed to act with the South Australian Government in the matter. Mr. Yelland also directed attention to the published circular issued by the committee of the Poultry and Kennel Club and the Royal Agricultural Society. It was there asserted that the Government had unofficially advised the members of the committee that it was quite prepared to adopt the Victorian regulations, with a few additional conditions, which would absolutely prohibit the importation of poultry from the sister State, and would only relax such provisions as would be consistent with the course pursued by Victoria. The members of the Council expressed surprise at the statements made in the circular, and decided, on the motion of Mr. Yelland, to ask the Minister if any such promise of retaliation had been made.

On motion of Mr. Miller, it was resolved that the Minister of Agriculture be asked to obtain from the United States Department of Agriculture full particulars concerning the alleged successful adoption of the practice of "vaccinating" the soil with cultures of nitrogen-gathering bacteria for the growth of leguminous crops, and also to obtain a supply of the material for trial in South Australia.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on January 1, 1905:—

The weather during past month left nothing to be desired for the better harvesting of the crops; thus December 31 completed twelve months of favourable conditions to the producing interests throughout the Commonwealth; but more especially does this apply to South Australia, and it is admitted on all sides that the farming community are undoubtedly now experiencing a wave of prosperity. The squatting element are also satisfied with the treatment received during 1904, the plentiful supply of feed and water enabling them to considerably increase their flocks; besides, Wool has met with improving markets.

COMMERCE.—With such excellent harvest prospects, it was only to be expected that the volume of business put through would reach some magnitude. In this direction the houses were not disappointed, for early in the month heavy Christmas buying orders came along, and continued throughout. Speculators in Silver and Lead stocks are well satisfied with the further developments at Broken Hill, for not only has the output from the mines increased, there is also an appreciable improvement in values.

BREADSTUFFS.—Bad weather in the Argentine, where the harvest is now being reaped, caused Wheat quotations in the European markets to advance fully 1s. per quarter; but a return to fine weather enabled the merchants there to offer largely, consequently prices declined, until at the present time 32s. 9d. is the full value for moderate-sized Australian cargoes. In the Commonwealth keen competition has taken place for any offering. Sydney millers are reported to be paying 3s. 6d.; but in Victoria rates are not so firm, and large quantities of Wheat are obtainable at about 3s. 4d. per bushel f.o.b. In South Australia, although a very fair supply is coming to hand, buyers in the country are extremely keen, and prices considerably above the European parity are being paid. Little has been done in Flour, except for forward local contracts, bakers having booked very fully at from £8 to £8 5s. per ton for city brands. **FODDER.**—As the new hay crop is known to be of prime quality, chaff merchants have had a fairly strong export market, parcels of chaff being already booked for January-February delivery; but the trade locally has been mostly just to fill ordinary wants. Offal has been in good demand, and millers' stocks are light, Pollard especially being scarce. Forward sales have been made at an advance on our previous quotation. In Oats and Barley there is not much of the new crop yet offering.

POTATOES had heavy business, which just about exhausted the crop from the plains, and as values had a decidedly firming tendency, several parcels were brought along from Melbourne. Onions received much more attention than is usual at the time of year—this the result of high rates ruling in

the Eastern States—so that there has been considerable speculation for export. *Selling rates sharply advanced, with market closing firm.

DAIRY PRODUCE.—The exports of Butter to the Home Market this season at one time bid fair to be heavy, and whilst they certainly show an increase on that of recent years, unfortunately shipments are about finished, as an unusually abrupt lessening in supplies set in. Indeed, to such an extent that local market for fresh in prints advanced quite 2d. per lb., so that factories are now printing their output for South Australian demands. Prime Dairy and Separators also participated in the rise, and as Christmas approached very heavy enquiry also set in for Collectors' and Pastry Butters: but now that the holidays are over prices of some of the lower grades have toned down. Eggs.—It is seldom that selling rates ease immediately in front of Christmas, but this year prices fell until 5½d. loose was touched; however, as the East started operating, a recovery was speedily effected. Cheese.—This line has experienced a good month's trade, but, as factories continued to deliver freely, no alteration in values is recorded. Bacon has been in much better request, large parcels finding quittance, although any advance is precluded, whilst price for the live hog keeps low. Hams had seasonable demand, the turnover being extensive, and market is now quite bare of assorted weights. Honey.—Good-sized parcels of the new take continue to be marketed, so that prices are weak. Almonds have met with only moderate call.

LIVE POULTRY.—During the early weeks of December an excellent market ruled for all pens of well-conditioned birds, buyers then purchasing freely for their Christmas requirements, so that spirited competition was experienced: but at the last couple of sales the markets were glutted with heavy consignments of poor and miserable stuff, which to quit necessarily had to sell at low figures, which helped to also bring down rates for better-class birds.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/4 to 3/4½ per bushel of 60 lb.

FLOUR.—City brands, £8 to £8/5/; country, £7/10/ to £7/15/.

BRAN.—8½d. to 9d.; POLLARD, 9½d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/5½d to 1/6½d.; White Champions, 1/8 to 1/10 for prime.

BARLEY.—Cape, 1/8 to 1/9 per bushel.

CHAFF.—£2/15/ to £2/17/6 per ton of 2,240 lb., f.o.b. Port Adelaide.

POTATOES.—New locals, £7 to £7/10/ per ton of 2,240 lb.

ONIONS.—New locals, £5 to £5/10/ (for prime) per ton of 2,240 lb.

BUTTER.—Factory and creamery, fresh, in prints, 9½d. to 11d.; choice separators and best dairies, 8½d. to 9½d.; good stores, 6½d. to 7½d.; pastry and heated, 5½d. to 6½d.

CHEESE.—Prime new make, 4½d. to 5½d. per lb.

BACON.—Factory-cured sides, 6d. to 6½d.; farm flitches, 5d. to 5½d. per lb.

HAMS.—S.A. factory, 7d. to 9d. per lb.

EGGS.—Loose, 6½d.

LARD.—In bladders, 5d.; tins, 4d. per lb.

HONEY.—2d. for prime, clear, extracted new season's, in 60-lb. tins; beeswax, 1/3 per lb.

ALMONDS.—Soft shell, 4d.; kernels, 8½d. per lb.

LIVE POULTRY.—Heavy-weight, prime table roosters fetched 1/10 to 2/6 each; plump hens and good-conditioned cockerels, 1/4 to 1/9; poor and light, 10d. to 1/1; ducks, prime, 2/ to 2/6; light and medium, 1/2 to 1/9; geese, good quality, 3/6 to 4/9; poor and half-grown, 2/ to 3/; pigeons, 5d.; turkeys 6d. to 8d. per lb., live weight, for prime; 4½d. to 5½d. for fattening to fair table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Jan. 18	Feb. 15	Minlaton ..	Jan. 7	Feb. 11
Balaklava ..	14	11	Morgan ..	21	18
Booleroo Centre ..	17	14	Mount Pleasant ..	—	Mar. 3
Bowhill ..	—	4	Nantawarra ..	18	15
Brinkworth ..	6	3	Naracoorte ..	14	11
Burra ..	20	17	Norton's Summit ..	20	17
Cherry Gardens ..	10	14	Onetree Hill ..	19	16
Clare ..	20	17	Penola ..	14	11
Colton ..	7	4	Petersburg ..	21	—
Crystal Brook ..	14	—	Petina ..	—	25
Finniss ..	2	6	Pine Forest ..	17	14
Forest Range ..	19	16	Port Broughton ..	21	18
Gladstone ..	7	—	Port Elliot ..	21	18
Golden Grove ..	19	16	Port Lincoln ..	21	18
Kanmantoo ..	—	4	Reeves Plains ..	20	—
Kapunda ..	—	4	Richman's Creek ..	—	20
Kingscote ..	9	13	Riverton ..	21	18
Kingston ..	28	25	Saddleworth ..	20	17
Koolunga ..	19	16	Strathalbyn ..	30	20
Longwood ..	21	25	Utera Plains ..	21	18
Maitland ..	7	4	Virginia ..	16	20
Mallala ..	9	6	Whyte-Yarcowie ..	21	18
Mannum ..	21	18	Willunga ..	7	4
Meningie ..	14	11	Wilmington ..	18	15
Millicent ..	—	2	Woolundunga ..	14	11

“JOURNAL OF AGRICULTURE.”

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The Editor

“Journal of Agriculture,”

Adelaide.

AGRICULTURAL BUREAU REPORTS.

Naracoorte, November 12.

PRESENT—Messrs. J. G. Forster (chair), H. A. Forster, Williams, McLay, Caldwell, Duffield, and Schinckel (Hon. Sec.).

TICK IN SHEEP.—Members generally reported that they had found tick worse this past season than for a long while. Even though having tick on them, most of the sheep that had been dipped were in good condition. It was stated that since dipping had been carried on systematically this district was remarkably free from tick, and one member attributed the trouble recently to the introduction of infested sheep from Victoria, and also to the fact that the blockers, keeping only a few sheep, did not trouble to dip them. It was unfair to stockowners that their flocks should become infested through undipped sheep being in the district. One station manager has been dipping his neighbours' small flocks at a moderate charge, with very beneficial results. The value of the arsenical dips was generally admitted, and the improvement in the wool was urged as a reason why all sheepowners should dip their sheep for their own sakes.

SWINGLETTREES FOR STRIPPERS.—The Chairman wanted to know the best style of swingletree to use in a stripper using four horses abreast, so that the crop would not be knocked about.

CATERPILLARS.—Mention was made of damage by caterpillars, and Mr. Caldwell stated that in one locality he came across an immense quantity, travelling north, in a body nearly 200 yards in width. It was stated that if a furrow was ploughed across their track, and lime or salt scattered over the insects as they got to the furrow, it would kill an immense number.

THE AGRICULTURAL DEPARTMENT AND THE SHOW.—Paper read at Balaklava Branch, on the use made by the Victorian Department of Agriculture of the Royal Show for educational purposes, was read, and greatly appreciated.

Kanmantoo, November 18.

PRESENT—Messrs. Lehmann (chair), O'Neill, R. H. and J. Downing (Hon. Sec.), and one visitor.

LIVE STOCK.—The Chairman read a paper on the constitution of animals, and some discussion ensued. It was decided to consider the paper further at next meeting.

COMEBACK WHEAT.—The Chairman tabled sample of Comeback wheat, grown from seed purchased from Mr. Marshall. This had yielded well, and, as it was reputed to be rust-resistant, should be a good variety for the district.

BUNT.—Some discussion arose on a question as to whether a bunt ball would grow, and the Chairman explained that the ball was simply a mass of seeds or spores of the fungus, which would germinate under suitable conditions, and infect the wheat plant. He described some experiments he had made in sowing wheat grains after covering them with the spores. The plants from seed pickled were almost free from the disease, but the unpickled seed produced nearly all bunt.

Nantawarra, November 23.

PRESENT—Messrs. R. Nicholls (chair), Dall, Dixon, Herbert, Green-shields, Rattew, Herbert, and J. Nicholls (Hon. Sec.), and two visitors.

FARM WORK.—Mr. C. T. Rattew read a paper on this subject. To work a farm to advantage an early start should be made with all work. Seeding should be commenced early, and pushed on quickly. To do this, it is necessary that the fallows should be well worked soon after ploughing; the cleaning of the land during summer should be left mainly to sheep, as dry cultivation was a mistake. Fallowing should be started early; as soon as possible after seeding operations have been completed. The hay should be cut early; good green hay was preferable to dry hay. Harvesting operations should be started directly the crop is ready, and should be pushed on as fast as possible, as at

this season of the year a day's lost time may mean the loss of many pounds to the farmer. He thought the farmer should have a stripper or harvester to every 100 acres to be harvested. Plenty of strength to work them was required, as no team should be expected to work the long day through. In the slacker periods between seeding and harvest, and harvest and seeding, the farmer should give some attention to permanent improvements—fences, buildings, etc. A blacksmith's shop was handy on every farm, as there were many odd jobs in this line the farmer could undertake, and thus save much loss of time; many of these jobs would have to be left undone if they could not be done on the farm. A good shed should be provided to house the implements, and every second year the implements should be well painted. This would not only be profitable, but would make the implements look as though they had an owner. Members agreed that fallowing should be finished as early as possible. Mr. Dixon liked a little corn in the hay, but most of the members agreed with the writer of the paper. Some of the members considered it would involve too great an outlay of capital to provide a stripper or harvester for each 100 acres under crop, but Mr. Rattew contended that the delay of a few days in completing harvesting would sometimes result in the loss of the price of an extra machine.

STOCK COMPLAINT.—Mr. Dall reported loss of several sheep. They became stiff in the legs, staggered about, and after death swelled up quickly. Some animals recovered which were placed in the shade when first noticed to be bad.

Wilmington, November 23.

PRESENT—Messrs. Sleo (chair), Hannigan, Schuppan, Sullivan, McLeod, Broadbent, Zimmermann, Bauer, and Payne (Hon. Sec.), and two visitors.

MEMBERSHIP.—Considerable discussion took place on letter from the Chairman in reference to proposed alterations in membership of the Bureau.

TANKS.—Mr. Lutz, of Petina Branch, wrote in reference to the construction of cheap tanks. Members were of opinion that the system outlined would not prove suitable in the heavy clay lands of the North.

RED RUST.—All the farming members brought samples of present season's crop, to show the effects of red rust on the different varieties. The following varieties were exhibited:—Gluyas Early, little or no rust, splendid grain, considered the premier variety; Allora Spring, no rust on sample; Gamma, no rust, very plump grain; Clubhead, very rusty, grain much pinched; Steinwedel, straw rusty, but grain fairly good; Purple Straw, very rusty, grain poor; Smart's Early Purple Straw, grain slightly pinched; Early Para, slightly affected by rust, but grain would pass standard; Budd's Rust-resistant, straw clean, and grain very plump; Marshall's No. 3, rust on flag, but not on stem; Leak's Rustproof, no sign of rust, grain very good.

Lipson, November 19.

PRESENT—Messrs. Charles Provis (chair), Swaffer, Carr, Brown, Bratten, McCallum, France, Brougham, Baillie, and Barraud (Hon. Sec.), and six visitors.

STANDARD BUSHEL.—Mr. Bratten suggested that the Branch should obtain a tested imperial bushel measure, as the small scales used by the wheatbuyers were not always reliable. The Hon. Secretary strongly advocated a fixed standard of not less than 64 lb. per bushel. South Australian farmers should endeavour to raise the quality of their wheat in the world's markets. Any wheat for export that did not reach the high standard could be graded up to that standard, except in rusty years, when it might be necessary to sell the wheat as second grade.

ECZEMA IN HORSES.—In reply to question as to treatment of this complaint, Mr. Bratten advised the application of an ointment consisting of sulphur, lard, and burnt leather.

IMPACTION.—A visitor stated that he found that if given early Epsom salts was a certain preventive of dry bible in cattle.

Inkerman, November 22.

PRESENT—Messrs. Kennedy (chair), Williams, Mugford, Smith, Lomman, Fraser, and Smart (Hon. Sec.).

SIZE OF WHEATSACK.—Mr. Fraser, in referring to Congress, stated that Mr. Mugford introduced the discussion in opposition to proposed alteration in the size of the wheatsack.

MEMBERSHIP OF THE BUREAU.—Mr. F. C. Smart read a paper on "Who should be Members of the Bureau?" Much had been said about increasing the limit of membership of the Branches, and in other ways altering the constitution of the Bureau, but he thought, where there was a full roll, and others wishing to join, some system of culling out should be resorted to. A mistake was often made in selecting gentlemen as members, the same as was made in selecting judges for implements at shows. An old and respected farmer, most of whose work is done by his sons or hired men, is appointed as judge of implements, some of which he has perhaps never worked. If the men who actually used the implements were appointed as judges, he thought the results would be more satisfactory. The same thing applies to Bureau membership. It was the men actually engaged in farming operations that they wanted most. He knew, of course, that many of the older members throughout the State were the most useful, but they wanted young men also. Another man they should try to secure as a member is the one who takes an interest in all matters connected with farm work and live stock. He may sometimes be the proverbial "jack of all trades," but generally he can tell them something worth knowing, and will take an interest in the Bureau meetings. One of the most important points to consider. The schoolmaster who takes up experimental work is a useful member, and often makes a first-class Secretary. The man who makes a study of any particular branch of agriculture is a very desirable man, provided he is willing to impart to others the knowledge he possesses. Then the man who wants to learn is a useful member, as he will probably be a regular attendant at the meetings, and will ask questions which, if answered, will prove of service to others than the questioner. Undoubtedly the best member is the one who will make an effort to attend every meeting, and who goes with the intention of learning all he can and imparting what he knows. There were some men they did not want as members, especially when they kept better men away. There was the man who knows a lot, but keeps it to himself, while getting all he can from others. Another undesirable man was what was usually called a "know-all." Such were not wanted on any Branch.

Petina Well, November 25.

PRESENT—Messrs. W. Penna (chair), R. and A. Penna, Giles, Cocks, Norton, and Fiddaman (Hon. Sec.), and three visitors.

ANNUAL REPORT.—Twelve meetings held, with an average attendance of six members and two visitors. Seven papers had been read and discussed, and the meetings generally had been instructive, but the Chairman and Hon. Secretary appealed to the members to be more regular in their attendance. Officers were thanked and re-elected.

FARMING.—Mr. B. Norton read a paper on "Items of Interest to those who Intend to Commence Farming." He considered that the would-be farmer should be possessed of contentment, industry, and experience. He must be content to settle down on his farm and make the best of things. Industry is essential. There can be no such thing as an eight-hours day on the farm, and the sooner this is recognised the better for all concerned. Without experience the would-be farmer will find himself seriously handicapped. Under existing conditions on the West Coast they required from 1,500 to 2,000 acres to make a good, workable farm, and care should be exercised in selecting the land. Soil, proximity to market or shipping port, and means of communication should all receive careful attention. When the newcomer gets on to the land he finds a hundred and one jobs requiring attention, and usually he first attempts to get some land under crop, in order to get a return as quickly as possible. He thought, however, in this matter a serious mistake was often made. In districts where the rainfall was unreliable and natural supplies of water did not exist the first thing should be to put down a well or build a tank. In this locality a tank was more reliable than a well, and it should be

of at least 15,000 gallons capacity, and preferably double that. If this work is neglected to get in a crop the farmer may soon find himself reduced to water-carting—the most expensive and unsatisfactory task he has to undertake. Wherever it was possible, he would advise the beginner to endeavour to farm some land on halves before he actually makes a start himself, as by so doing he will earn some money and get his seed cheap. Care must be given that the land is thoroughly cultivated, and everything possible done to ensure a crop. A rust-resistant wheat should be sown. There was too much risk of loss with the rust-labile varieties. In fencing, he would endeavour to erect a ring fence of 42 in. netting, with a barb wire above. He was sure that where this could be done it would pay handsomely. The general practice was to fence the paddocks as they were cleared, but this meant an unnecessary expense for netting. True, the netting could be shifted as fresh land was cleared, but it would be stretched in all shapes, besides which the taking down, rolling up, and re-erection of the netting involved a lot of labour. If a ring fence is erected and the vermin destroyed, the division fences to start with may consist of posts and two barb wires. The farmer needs firmness and judgment in buying implements. If he lacks these the machine agents will probably induce him to buy a lot of unnecessary and costly implements, for which he has little use. No implement should be bought until it has been carefully examined and seen at work. Deal direct with the city firms. Every farmer should carry on his work in a systematic way. There should be a place for everything. Implements and tools should be put away when finished with, and not left all over the place. Many farmers were very careless in this respect, the result being that their implements do not last as long as they should, and many articles are lost sight of. Mr. Giles did not believe in fencing the whole area at once. Not only would it entail a larger outlay, but it would be difficult to deal with vermin on such large blocks. Some of the members advocated a ring fence and the subdivision of the farm into fair-sized paddocks, in order to cope with the vermin. One visitor advocated dealing with local tradesmen, as it kept money in the locality, and a local man was more likely to deal fairly with them than was a stranger.

STALLION TAX.—This subject was discussed, members generally being in favour of a tax on travelling stallions on the lines suggested by Eudunda Branch, viz., that the money so raised should be devoted to prizes for the best stallions travelling in the district.

Arthurton, November 18.

PRESENT.—Messrs. Hawke (chair), Wicks, Short, S. and T. Lamshed, Pearson, Welch, Koch, Stephenson, and Rowe, and two visitors.

BUSINESS.—This was a homestead meeting, held at the residence of Mr. W. H. Hawke, and little formal business was transacted. Feeling reference was made to the loss sustained by the death of Mr. H. Freeman, one of the oldest and most active members of the Branch, and it was decided to forward a letter of condolence to the family. Mr. Hawke reported on recent field trial of harvesting implements.

Mount Remarkable, November 17.

PRESENT.—Messrs. Casley (chair), Morrell, Yates, Smith, Kaerger, Giles, and O'Connell (Hon. Sec.).

CATTLE COMPLAINTS.—Mr. Casley stated that his cattle had been much troubled with grass seeds in their eyes. To remove the seeds he dipped a finger in cream and then passed it under the eyelid. This brought the seeds away. Mr. Kaerger had a cow with bad teats. Instead of milk only thick, lumpy matter could be drawn from the affected teats. He also wished to know the cause of cattle chewing bones. Members agreed that this was due to want of phosphates, and that the habit was not in any way harmful. Bone-meal should be supplied regularly to the cows.

HORSES EATING EARTH.—Mr. Kaerger reported that some of his horses were very fond of licking up dirt, although well supplied with salt.

Riverton, November 19.

PRESENT—Messrs. Gray (chair), Malcolm, James, Badman, Camac, J. W. and E. Kelly.

PIG-BREEDING.—Mr. N. Malcolm read a paper on this subject. Perhaps at this juncture, when marketing conditions are so unsatisfactory, pigs are not viewed so favourably by the farmer as they were twelve months ago: still he was confident that pigs can be profitably kept on every farm. Even in these times of poor prices they will more than pay for their keep and the labour involved, if a little forethought is exercised in making provision to supply their requirements. First, the farmer should provide a number of small paddocks in which to run the pigs during those periods of the year when their unrestricted movements over all the farm must be prevented. These small runs should be fenced with stout netting or barbed wire—he found the latter just as effective and cheaper than netting—and planted with suitable crops for green feed. Barley, lucerne, rye, vetches, kale, or rape will do well, and grow freely again after being fed off. By having several small paddocks they can be fed off in rotation. This green feed will practically supply the requirements of the pigs from August to November, when peas, which should be sown in July on the fallows, will be ready. There should be enough of this crop to last until harvesting operations are well under way, when the heads and other unmarketable produce may be utilised with advantage. Pumpkins and pie-melons, planted in October, will give variety to the diet when the pigs are on the stubble in the autumn. Under this treatment a month in the fattening pen, on grain or pollard, should enable the farmer to supply the factories and his own household with pork. During the winter the annual supply of bacon and hams should be cured for home use. The question as to the most suitable age at which to fatten pigs with the greatest profit is one which every pig-breeder must carefully consider. Some experiments on this point carried out in Denmark gave some interesting results:—Pigs weighing from 75 lb. to 115 lb. made 1 lb. increase in weight on 4.37 lb. of food; pigs of 115 lb. to 155 lb. required 4.67 lb. of food; pigs of 155 lb. to 195 lb. ate 4.99 lb. of food; pigs weighing 195 lb. to 235 lb. ate 5.43 lb. of food; and those weighing 235 lb. to 275 lb. consumed 6.24 lb. of food for each pound in weight gained during the experiment. It will be seen that the heaviest pigs consumed nearly 50 per cent. more food than the young ones to make the same gain in weight. Apart from this, they must also remember that the best local demand was for light-weight pigs. In fattening, he found it was advisable to feed pollard morning and evening in a thick mixture, with skim or separator milk, greasy house water, or clean water, according to what is available, and to give grain and green feed at midday. Clean water should be kept in a separate trough in each pen. Charcoal should also be supplied. In cold weather feed all slop food warm, and also give them plenty of straw for bedding. In regard to the best breeds, the farmer must first determine what market he intends to breed for, and select his breeding stock accordingly. As much care should be exercised in founding the herd as the woolgrower exercises in the selection of his stud. Inbreeding should be studiously avoided by the farmer. The best pig will prove the cheapest in the long run, though he may cost a little more at first. This is especially the case with the boar, as his progeny may number a hundred or more in a season. Of whatever breed selected, buy from a breeder of good reputation, and see that the pig is possessed of a clean pedigree. His frame should be compact, and the carcass as long and deep as is consistent with strength. The sexual organs should be well developed and even; he should be of good temper, and last, but not least, see that he is furnished with 12 to 16 teats, evenly placed, as in such case there is every likelihood that his female progeny will develop into good breeders. The sows need not necessarily be purebred, but they should be big and roomy, but at the same time strong and active; they should have at least twelve teats, placed at regular intervals, and each should be well formed, so that with a full litter each young pig will be able to secure its share of milk. In crossing for various purposes the first cross is the best, though some breeders like the "comeback," but in this case particular care should be taken that the two boars used are not related. A "comeback" that he was greatly impressed with as a general utility pig was produced by crossing a large black Essex sow with a Berkshire boar, and mating the female progeny with another Berkshire. In this way he would expect to obtain large litters, which would rapidly furnish into shapely porkers to meet trade requirements, or, if kept to a later stage, should develop into useful bacon pigs. The double strain of the Berkshire should supply the fat-

tening qualities, with full, well let down hams, while from the large black English they would get increased productiveness in the sows and more rapid development in the progeny. For bacon purposes they would also secure pigs with a weighty middle, which always commands good prices. For bacon purposes only he would not go beyond the first cross of the Berkshire with the large white Yorkshire, the large black English, or the Tamworth. He preferred mating the White Yorkshire boar with Berkshire sow, but with the large black English cross he would make use of the Berkshire boar. If the black boar is used there is a tendency in the progeny to rapid development of frame rather than inclination to shape and fat, while the hams are not so full and deep as in the progeny of the reverse cross. Should the farmer decide to breed what are described as "bright, handy-weight, shop porkers," he recommended crossing the Berkshire with the small black or the small or middle white pigs. As regards future prospects, he was confident of the success of the industry, provided it is placed on a sounder commercial basis. They must develop outside markets for the surplus produce; new channels of trade must be opened up. Pork can be grown cheaply in the State, but farmers were naturally rather chary of converting grain and offal into a commodity which, owing to the restricted local sale, is so variable in price. The Government should obtain and publish full information concerning the methods adopted in America by those engaged in the pig industry, and also instruct farmers on the best methods of curing hams and bacon, so that the individual farmer could place on the market a good, saleable article. He had been assured by one of the leading Adelaide produce merchants that very few farmers cured their meat properly, and consequently the trade would scarcely touch farm-cured bacon or ham. The industry in this district could be put on a much better basis by the establishment of a co-operative factory in their midst. It was quite certain they would have to make some effort to help themselves to obtain more remunerative prices for their pigs, and he thought a co-operative factory would probably be the best scheme.

Rhine Villa, December 3.

PRESENT—MESSRS. G. A. Payne (chair), H. Mickan, H. Mickan, jun., Pannach, and W. T. and J. Vigar (Hon. Sec.).

COMPLETE HARVESTER.—This meeting was held at Mr. W. T. Vigar's farm for the purpose of inspecting the complete harvester at work. Members expressed themselves as well satisfied with the way the machine did its work, but were unanimous that in this district farmers could not afford to waste the cocky chaff, which was of great value for feeding stock.

Meadows, November 28.

PRESENT—MESSRS. Peatson (chair), Griggs, Ellis, W. J. and C. Stone (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—This meeting was held at Mr. G. T. Griggs's residence, Prospect Hill. The ensilage pits, outhouses, crops, and orchard were carefully inspected. Mr. Griggs has about seven acres under apple trees on land cleared of scrub, and they are doing well. A patch of *Paspalum dilatatum*, which had made very good growth, was also inspected, and some discussion on the value of this grass took place. Most of the members consider both clover and cocksfoot more satisfactory for this district.

Woodside, November 28.

PRESENT—MESSRS. Keddie (chair), Fowler, W. and H. Rollbusch, Droge-muller, Murphy, Morcom, Kleinschmidt, and Hughes (Hon. Sec.), and one visitor.

BUSINESS.—Mr. Fowler read a paper on "Sixty Years' Settlement of the Onkaparinga Valley." Mr. Hughes, of Longwood Branch, forwarded comments on proceedings of recent Conference.

Port Pirie, November 19.

PRESENT—Messrs. Wright (chair), Teague, Morrish, and Wilson (Hon. Sec.).

SHORTWEIGHT BINDER TWINE.—The Chairman stated that he had received two bundles of binder twine which were 7 lb. short in the total weight.

CO-OPERATION.—The Hon. Secretary read account of the Murtoa Farmers' Union. The working of this association was compared with that of the South Australian Farmers' Co-operative Union, to the disadvantage of the latter.

UTILISATION OF WASTE FARM PRODUCTS.—Mr. W. Morrish read a paper on this subject. He classed as waste farm products those for which there was no sale in the ordinary market, and the best way to utilise these was to convert them into something else that could be readily disposed of. Waste products, such as wild oats, weeds, and annual bushes, were best utilised by feeding them to stock. By combining grazing with cultivation, not only was the land cleaned, but the labour in connection with cultural operations was reduced. The straw remaining after stripping was a product usually wasted to a great extent. Where the stubble is thin and stunted, the best use to make of it is to graze sheep or other stock on it, as they eat such stubble very readily. Where the straw is thick and luxuriant, a large proportion of it should be cut soon after the wheat is stripped and be stacked. He was a strong advocate for a good straw stack in every paddock. A straw stack not only provides a warm shelter for stock against the bleak winds; but in the early spring, when the grass is soft, and contains but little nourishment, the straw is very useful for feed purposes. Where the farmer intends to crop the land the following year the old practice of burning the straw was the best, as it destroyed numerous seeds of weeds, also insects, etc. In good seasons farmers generally allow a lot of wheaten chaff to rot in the fields. In view of the great value of this chaff in dry seasons, farmers should store a plentiful supply when they get a good crop. A natural result of a good season was an increase in the stock, and it was absolutely necessary that they should make all possible provision for the bad seasons, when frequently the farmer has to dispose of his stock at a great sacrifice. Sufficient pigs and poultry should be kept to consume all the inferior and refuse wheat. Often the farmer will realise more for inferior grain used in this way than from the wheat he sells. All the manure made on the farm should be conserved in pits, and allowed to rot before being used. It was a good plan to have two pits, each of which should hold a year's supply of manure. If the manure is well rotted, and is sieved, it can be mixed with the super or other fertiliser used, and applied by means of the seed-drill. The coarser particles should be spread on the poorer land, to improve it.

Port Lincoln, November 19.

PRESENT—Messrs. Laidlaw (chair), Reuter, O'Shanahan, Kinmont, Richardson, Bruce, Puckridge, and Sage (Hon. Sec.).

COMPLETE HARVESTER.—Mr. Reuter read a paper on this subject. He recognised the harvester as the coming machine for harvesting their grain crops, as it reaped, cleaned, and bagged the grain at one operation, and owing to being able to work it when the wheat is not dry enough for the stripper, one harvester could, with a change of horses, get over as large an area as two strippers. A farmer with 1,000 bags of wheat to harvest will save £20—the cost of winnowing—by using the harvester. It was not, however, a suitable machine for rough or hilly country. Mr. Bruce agreed with Mr. Reuter. Last year he took off all his crop with the harvester, and was often at work when the strippers around him were idle. They got the barley cleaned splendidly, and on one occasion took off 44 bags in one day with a single team. They had no trouble with the harvester in an eight-bag crop. The Hon. Secretary said the cocky chaff from the winnower was very useful, especially in their wet winters. One of his old neighbours used to say that the chaff paid for the cost of winnowing the wheat. Mr. Reuter said he never used cocky chaff for the working horses, though it was useful for other stock; he admitted the harvester was of heavier draught than the stripper.

Quorn, November 19.

PRESENT—Messrs. Thompson (chair), Toll, McColl, Noll, Cook, Smith, and Walker (Hon. Sec.).

LIST OF FERTILISERS.—Members were dissatisfied with the Editor's reply to suggestion that a statement showing the best kinds and quantities of manures to use for different crops should be published by the Department. They were of opinion that it was practicable to draw up such a statement, and that it would be of great value to the cultivator.

RECLAIMING DRIFT LAND.—Mr. A. F. Noll read a paper on this subject. While a good deal had been said and written on the treatment of drift land, very little had been done to assist Nature to reclaim these barren wastes. He was one of those unfortunate enough to have a considerable area overrun by sand in 1902 and 1903. About one-third of this area was reseeded naturally in the winter of 1903; but a considerable area remained bare and barren, the few plants that sprang up being cut off by the sand on the first windy day. Recognising that without some help from him this land was likely to remain useless, he obtained a seeder, and fixed it to a four-furrow plough. As soon as seeding was finished he shifted out to this desert area, and with two teams of six horses each tackled the job in front of him. In addition to the plough with the seedbox attached, they also sowed the wheat broadcast ahead of a good cultivator. Taking lands about 100 yards in width, they ploughed up strips about four yards wide, going round and round, so that if the wheat was worth it they could strip the same way as the land was ploughed. In this way about 60 bags of wheat were sown, and when this was done they went on ploughing strips through the paddocks to give the seeds of the natural herbage a chance to get established. In all about 2,000 acres were treated, and now they had about 1,500 acres between the strips of wheat which were worth stripping, on which there was a fair amount of herbage. He was satisfied that he had demonstrated that, by aiding Nature in this way, they could soon turn these barren patches into good pasture. Mr. Noll tabled wheat in straw and cleaned from this drift land. Several of the members spoke from personal inspection of the wonderful success of Mr. Noll's efforts to reclaim this drift land.

RED RUST.—Mr. Rowe gave a short address on this subject.

Petersburg, November 29.

PRESENT—Messrs. Cadzow (chair), Philp, Travers, Dempsey, and Sambell, and one visitor.

THE DAIRY COW.—Mr. D. J. Travers read a paper on this subject. He favoured the Shorthorn-Jersey cross for dairy purposes, care being taken that both parents come of good milking strain. He advocated the use of the Babcock tester, in order to ascertain which cows were yielding best. The dairy cow was like most other animals: to give the best results, it was essential that she should be well fed. This was somewhat difficult in the drier portions of the State, where green feed could not be grown during the summer and autumn months. At the same time, there was room for improvement in the way in which the cows were treated on many of their farms. Shelter should be provided, especially in the winter, and in addition to the natural herbage in the paddocks the cows should be fed on bran and cocky chaff twice a day.

Morgan, December 17.

PRESENT—Messrs. Windebank (chair), Haupt, Hewitt, R. and H. Wohling (Hon. Sec.), and two visitors.

POULTRY COMPLAINT.—Mr. H. Wohling reported his fowls to be suffering from some complaint causing them to become weak and crippled in the legs. A visitor reported his young birds to be similarly affected. [This may be due to several causes; but unless members examine their birds, and give some definite information concerning the trouble, it is impossible to suggest any treatment.—Ed.]

Port Elliot, November 19.

PRESENT—Messrs. McLeod (chair), Pannel, Nosworthy, Brown, H. and H. B. Welch, Stock, Green, W. E. and W. W. Hargreaves (Hon. Sec.).

LOGANBERRY.—Mr. Green tabled sample of this fruit, which he stated was superior to either the raspberry or blackberry.

BOTS IN HORSES.—Mr. Green stated that the following treatment was effective for bots in horses:—Give 2 quarts of new milk and 1 quart of molasses; this causes the bots to loose their hold. Fifteen minutes later give 2 quarts of sage tea, and half an hour afterwards 3 pints of oil, to remove the bots. [All veterinary authorities are agreed that treatment of the nature suggested is quite ineffective for ridding horses of bots.—Ed.]

MANURE EXPERIMENTS.—Two of the members reported failure with guano for cereal crops.

LOSS OF HEIFER.—Mr. H. Welch reported finding a heifer dead in one of his paddocks recently. She had got out of the paddock in which she was grazing, and there was no outward appearance to indicate cause of death, but the lungs were full of blood. Members thought that in getting through the fence the animal must have strained herself or broken a blood vessel.

Renmark, November 24.

PRESENT—Messrs. Showell (chair), Cole, Huggins, Waters, and Evans (Hon. Sec.), and four visitors.

SOIL INOCULATION.—Considerable discussion took place on the article on this subject published recently in the local papers. Members recognised that if the results alleged to have been obtained in America could be secured in Australia the discovery would be of incalculable value. It would be the means of bringing into cultivation a large area of land at Renmark which at present is so deficient in nitrogen as to be almost incapable of producing any crop whatever. It was decided to ask the Department to take steps to secure some of the soil cultures from the United States. [This matter has already been attended to. At the same time, it is only right to point out that we have no official records which in any way indicate that this matter has got beyond the experimental stage as yet.—Ed.]

Calca, November 26.

PRESENT—Messrs. Roberts (chair), Bowman, Smith, Wilcott, and Newbold (Hon. Sec.), and five visitors.

PAINTING WOODWORK.—Mr. A. Plush forwarded a paper on this subject. He advised first washing the wood clean and drying it thoroughly. Then apply a coat of zinc white, with sufficient colouring to make it a light pink. After, use the colour desired. If they wanted good paint they must buy the materials and mix it themselves. Bought mixtures did not give satisfaction.

TAKEALL.—Mr. A. Newbold read a paper on the "Takeall Grub." (?) This name was applied in this district to a grub which completely destroyed hundreds of acres of crops and grass each year on the West Coast. At the beginning of the winter the young grubs may be found in colonies on low-lying spots of land where the water had been lying. The grubs spread over the land from these centres, destroying all grass and wheat that they come across, and sometimes hundreds of acres of land bored with small round holes may be noticed. As the warm weather sets in, the grubs cease their work, and undergo the usual changes, becoming small brown beetles, which collect around the lights in the houses on warm nights. One thing he had noticed particularly was that after a severe infestation of grubs the land yielded a splendid crop. He had not met these grubs in any other part of the State.

LAMPAS.—The Chairman enquired best treatment of lampas. He thought burning the only effective method. Mr. Bowman advised lancing. [All up-to-date authorities are agreed that burning is an unnecessary and cruel method. Usually a course of soft food, following a slight purgative, will be sufficient; but in severe cases the bar may be lanced, cutting across the bar, but avoiding the middle.—Ed.]

Virginia, October 24.

PRESENT—Messrs. Hatcher (chair), Baker, Odgers, Johns, Pavy, Huxtable, J. E. and J. J. Taylor, and White, and five visitors.

LAMBS FOR EXPORT.—Mr. P. Baker read a paper on breeding lambs on the farm. The development of the export trade in lambs afforded the average farmer, who makes the growing of wheat or hay his main aim, an opportunity of increasing the returns from his land. He was strongly of opinion that for the lamb trade the best results would be obtained by mating a good Lincoln-Merino ewe with a Shropshire or South Down ram. The lambs will be hardy, of good shape, and will develop quicker than the progeny of the pure Merino ewe. Then, again, the crossbreds will make better mothers and give more milk. They are steadier in the field, and not so likely, when turned into a fresh paddock of good feed, to waste by treading it under foot. When pure Merino ewes are used for lamb breeding he would advise selecting large frames, using such as the Bungaree, Canowie, and other well-known strains. He preferred the Shropshire rams, but the Dorset-Horn was also favourably spoken of. Care should be exercised in selecting the ram, as they could not expect to get good stock from an inferior sire. When the ewes are lambing it pays to go quietly through the flock once a day to see that all is right. Save a good paddock of feed for the ewes and lambs. It will in most cases pay to sow barley, or other quick-growing plant, specially for the ewes. He would draft out the ewes with lambs when the latter were about a week old, and place them on the paddock reserved for them. Unless they have plenty of green feed from the start the lambs will be checked in growth and will never give the same results as those that keep growing all the time. He had always found that the lambs with ewes running on soft weeds—dandelion, charlock, and the succulent annual grasses—grew faster than those on the permanent grasses; the latter apparently did not give such a good flow of milk. During the early winter months it will pay to hand-feed the ewes on chaffed hay; 1 lb. per day per ewe in addition to the feed in the paddocks will suffice. He strongly believed in dividing up the flock; 200 ewes with lambs will do much better in two or four lots than in one mob. With a sufficiency of good feed the lambs should weigh 38 lb. to 40 lb. in four or five months; they should not be sold under that weight. Overstocking must always be avoided. It was safe in estimating the size of the flock that the farm will carry to work on the basis of its carrying capacity in a bad season and not of a good year. It was better to have to plough the feed under in a good season than to run the risk of being caught overstocked in a bad year. Besides this, the man that is carrying too many sheep will probably use for pasture the land that should be fallowed early in the year, with the result that the loss on the following crop will more than counter-balance any profit derived from the few extra lambs raised. In reply to question whether it would pay at present prices to go in wholly for sheep instead of hay and wheat, Mr. Baker thought it was better to combine the industries.

QUESTION-BOX.—A number of questions asked through the question-box were answered. The rams should be put with the ewes about the middle of November. Where there was no fear of drift, it was better to work the fallow down fine instead of leaving it rough. Sorghum should not be sown with lucerne, as being a quick grower it will ruin the lucerne. If manures are kept dry, members did not think they would deteriorate much if kept over a year; but, at the same time, they preferred the new make. Steel wire was considered superior than iron wire for fencing. Members were doubtful of the wisdom of selling wheat by auction.

Davenport, December 1.

PRESENT—Messrs. Trembath (chair), Roberts, Hodshon, Holdsworth, Hewitson, and Lecky (Hon. Sec.), and 25 visitors.

SOME LESSONS FROM THE DROUGHT.—By invitation, Mr. W. G. Pryor gave a lengthy and instructive address on this subject, dealing with the heavy losses occasioned by the drought, and the means of avoiding or mitigating such losses in the future.

Mount Bryan East, November 26.

PRESENT—Messrs. Wilks (chair), Teddy, Bruce, B. H. and R. W. Dunstan.

HON. SECRETARY.—Mr. R. W. Dunstan was appointed Hon. Secretary in place of Mr. E. S. Wilks, resigned.

SMART'S EARLY WHEAT.—Mr. Bruce tabled samples of this wheat reaped that day, the sample being a good one, and the crop going about 12 bushels per acre. He did not consider the wheat a suitable variety to grow, as it shakes badly. There was enough grain on the land to sow the paddock again.

BAGS AS WHEAT.—Discussion on the sale of the sack with the wheat took place. Members complained of the injustice of the merchants in insisting on a practice causing so much expense to the wheatgrower, and thought the various Branches of the Bureau should unite to demand an alteration.

STANDARD BUSHEL.—It was resolved that the Branch urge other Branches to unite to have the standard weight of a bushel of wheat fixed by Parliament.

Caltowie, November 18.

PRESENT—Messrs. Royal (chair), Kerr, L. and W. Graham, Potter, McDonald, A. and J. McCallum, Petatz, Neate, Moore, Jettner, J. G. and F. Lehmann (Hon. Sec.).

QUESTION-BOX.—Several questions asked through the question-box gave rise to interesting discussions. The majority of the members favoured the appointment of single expert judges at shows in the respective classes of exhibits. Members were of opinion that in the course of time the present varieties of rust-resisting wheats would to a certain extent lose their powers of resistance to this disease. Members were also of opinion that the use of superphosphate increased the liability to rust. [On this point, I think, most farmers will differ from opinion of Caltowie Branch.—Ed.]

Watervale, December 19.

PRESENT—Messrs. Treloar (chair), Sobels, Scovell, Ashton, Perrin and Castine (Hon. Sec.).

CODLIN MOTH.—Discussion on the treatment for codlin moth took place. Members were agreed that it was necessary to spray their trees three times before Christmas, and that the bandages must be regularly examined.

HARVEST PROSPECTS.—Members reported on fruit crop prospects. Apricots of early kinds are light; peaches, good crop, but on small side; plums, good; apples, fair; grapes and pears, good. The wheat crops are turning out well, and in many cases are giving better returns than the owners expected.

Mount Bryan East, December 17.

PRESENT—Messrs. T. Wilks (chair), E. Wilks, Thomas, Teddy, Pohlner, and Dunstan (Hon. Sec.), and one visitor.

WHEAT STANDARD.—Members declined to forward sample of the season's wheat to the Chamber of Commerce, as they did not consider that body any friend to the farming community. It was also resolved that farmers should refuse to sell their wheat, bags in; but should demand the price paid for the bags. The co-operation of other Branches is sought, members being strongly of opinion that the present system was a gross injustice to the farmer.

Kapunda, December 3.

PRESENT—Messrs. O'Sullivan (chair), Windebank, Daly, G. and S. A. Harris, Pascoe, Shannon, Teagle, and Holthouse (Hon. Sec.).

BUNT.—Messrs. Windebank and Teagle reported having noticed heads of wheat in their crops where one side contained sound grain, while the other was all smut. In both cases the seed had been pickled in the usual way with bluestone.

NOXIOUS WEEDS.—The Chairman called attention to the apathy displayed by many landowners in respect to the destruction of noxious weeds. If some effective action were not taken, the land in many cases would become practically valueless. It was useless one or two persons destroying the thistles and other weeds on their land if others took no action. The law should be carried out by all. Other members endorsed the Chairman's remarks. Mr. Shannon referred to the plant called stemless horse thistle; this grew flat on the ground, and was often found in the wheat crops. A determined effort should be made to destroy it before the district was overrun with it. The wild artichoke was generally agreed to be valuable for sheep, while Mr. Shannon also stated that the Scotch thistle was good feed for sheep.

Meningie, December 12.

PRESENT—Messrs. Shipway (chair), T. W. and F. Hiscock, Scott, Ayres, Myren, Botten, W. and C. Tiller (Hon. Sec.).

STANDARD BUSHEL.—Request from Chamber of Commerce for sample of the season's wheat gave rise to considerable discussion, and eventually a resolution in favour of a fixed standard of 60 lb., with extra payment for all wheat over the standard, was carried. The Hon. Secretary opposed the resolution, contending that a low standard would encourage laxity in cleaning the wheat, and would lower the price of their wheat in London. Members wished to know the standards in the different wheat-producing countries, and whether they were fixed annually or not. [We have not the figures of all the wheat-producing countries; but in every case, I believe, standards are fixed. In the larger producing countries two or more grades are always adopted, and wheat is bought and sold according to quality.—Ed.]

WHEATGROWING ON SCRUB LANDS.—Mr. Scott tabled samples of wheat, barley, and oats grown on the surrounding scrub land. The samples averaged about 3 feet in height, were well headed, and promised to yield well. Members generally thought that farming in the scrub would pay under a proper system of cultivation.

Millicent, December 1.

PRESENT—Messrs. Harris (chair), Hutcheson, Lindsay, Stewart, Holzgreffe, Oberlander, Hart, Major, Mutton, and Campbell (Hon. Sec.).

PURIFYING TANK WATER.—The Chairman called attention to the recent discovery of the value of bluestone for purifying water in reservoirs and tanks. The use of impure water at Baltimore (U.S.A.) having caused a number of deaths, the Department of Agriculture had conducted a number of experiments, with the result that the use of bluestone had been found to destroy the noxious vegetation without injuring the water for domestic purposes. Mr. Harris said that on reading this he put half a pound of bluestone in a 5,000-gall. open tank, in which a lot of vegetable growth existed, and the water was muddy. The result was very satisfactory, the water being now quite clear. Mr. Stewart recommended the use of alum, and Mr. Holzgreffe of lime, for purifying water.

GRAZING V. CULTIVATION.—Mr. Holzgreffe read a reply to criticisms on his paper read at August meeting, and Mr. Hutcheson read a further criticism on the paper, and considerable discussion ensued, the general view of members being that mixed farming was most profitable in the South-East.

CO-OPERATIVE BUTTER SELLING.—Mr. Campbell read a paper on this subject.

Clarendon, December 12.

PRESENT—Messrs. Payne (chair), A. and A. A. Harper, Phelps, Reece, Spencer, J. and P. Piggott, and Juers, and one visitor.

WHEAT FOR HAY.—Mr. A. A. Harper tabled two good hay wheats, viz., Majestic and Leak's Rustproof. Members considered the former the better variety.

POULTRY.—Mr. J. P. Juers read a short paper on "Does Poultry Pay?" In his opinion there was a fair profit to be made out of poultry; but, like all other industries, it required a considerable amount of time and thought, and some little expense. Poultry will not pay unless carried on in a systematic way. Care should be exercised in selecting the site for the yards; it must be well drained in winter, and preferably have some natural shelter. Common sense was one of the most important factors in success with poultry. In his opinion, a good pullet should lay at least 17 doz. eggs a year, which, at an average of 10d. per doz., is equal to 14s. 2d. per annum. As the cost of feed does not come to more than 5s., there was 9s. 2d. profit. He preferred the White Wyandotte to other breeds, as they were good layers, good mothers, and fine table birds. He had two pullets, which in 31 consecutive days laid in all 62 eggs. Poultry paid better confined in suitable yards than running at large, as they can be given just the foods required for egg production. Grit, shells, charcoal, and green feed must be provided, especially for poultry kept in yards. The drinking vessels must be kept clean, and in a shady place.

Saddleworth, November 18.

PRESENT—Messrs. J. H. Frost (chair), Benger, Hannaford, Eckermann, W. T. Frost, Klem, and Coleman (Hon. Sec.)

CATTLE COMPLAINT.—The disease amongst dairy cattle, generally known as impaction, is still reported in the district, especially with cows which have recently calved. Various reports on the complaint were read, and Mr. Hannaford recommended the following preventive treatment:—Give each cow a handful each of salt and bonemeal, 8 oz. sulphate of iron, and half a pint of molasses, in her feed every second day.

WHEAT EXHIBITS.—Several wheats in the straw were tabled. Smart's Pioneer looked very well. Majestic is a good hay wheat, also yields well, and although not quite so good in colour and quality as Dart's Imperial, its freedom from rust is a great consideration.

Mount Gambier, December 10.

PRESENT—Messrs. Mitchell (chair), Wedd, Edwards, Norman, Wilson, Ruwoldt, Watson, Bodey, and Collins (Hon. Sec.), and one visitor.

CEREAL EXHIBITS.—Mr. Ruwoldt tabled several varieties of wheat and two kinds of barley, the yields of which he promised to report later on. Mr. Mitchell thought Marshall's No. 3 the best yielding wheat for this district; but Mr. Ruwoldt considered Majestic equal to it.

SORREL.—Mr. Edwards gave a short account of visit to Glencoe district, and referred to the prevalence of sorrel. In reply to question, Mr. Ruwoldt stated he did not regard sorrel altogether a detriment to the land, as he found that clover overpowers it, and seems to do better than on land not infested by sorrel. Mr. Edwards said he got rid of sorrel on his land by sowing trefoil and clover on the infested paddocks. He had noticed that later sowing of clover had not done so well.

POTATO MANURING EXPERIMENTS.—Mr. J. M. Hattrick, representative of the Stassfurt Potash Syndicate, attended, with a view to inducing members to carry out systematic experiments in the manuring of potatoes, especially with a view to testing the value of potash in this district. Several members agreed to undertake experiments under the direction of the Department of Agriculture. Mr. Ruwoldt stated that he had not got satisfactory results from the application of bonedust to potatoes; but when the manure was applied to a wheat crop, and potatoes followed, the latter benefited to a marked extent.

Utera Plains, December 17.

PRESENT—Messrs. Hornhardt (chair), Jacobs, Guilder, Gale, Deer, Stening, A. R. S. and A. R. Ramsey (Hon. Sec.).

WORK OF BRANCH.—Considerable discussion on rules for conduct of Branch took place, and the printed suggestions submitted by the Department of Agriculture were generally approved. It was decided to have a special visitors' night twice a year, and also to devote an occasional evening to criticism of *The Journal of Agriculture*. It was decided to strictly enforce rule re non-attendance of members.

WHEAT EXPERIMENTS.—Mr. Hornhardt tabled five different wheats grown from seeds received from the Department of Agriculture, viz., Marshall's No. 3, Majestic, Waddy, College Selection, and Boomerang. The first three were not considered satisfactory for this district.

Port Pirie, December 17.

PRESENT—Messrs. Wright (chair), Hector, Johns, Bell, Holman, Teague, Crispin, Morrish, and Wilson (Hon. Sec.).

NORTHERN CONFERENCE.—Arrangements in connection with Conference of Northern Branches, to be held at Port Pirie on February 15, were considered. It was decided to invite Professor Angus, Veterinary Surgeon Desmond, and Mr. Suter, Dairy Instructor, to attend. [I would strongly appeal to members of Branches in the Northern District to make a point of attending this Conference, as proceedings are likely to be of an instructive nature.—ED.]

UTILISATION OF WASTE FARM PRODUCTS.—Paper read by Mr. W. E. Morrish at previous meeting was discussed. The Hon. Secretary would include in the list of such waste products bone, which should be collected and sold; scrap iron, wrought or cast, which the foundry or smelter owner will buy; and waste water from the house, which should be saved and used in the garden. Mr. Bell did not place any value on the wheat chaff from rust-resisting wheats. As to waste binder twine, he put it at the bottom of his haystack, as he could not sell it anywhere. The Chairman doubted whether it was possible to conserve as much manure as suggested by Mr. Morrish, and on their stiff, clay soil it would be quite useless.

THE FARM OF THE FUTURE.—Mr. T. Teague read a paper on this subject. During the past few years there had been a considerable improvement in farm practices in South Australia, and although such rapid progress in the future can hardly be expected, there will doubtless be some interesting changes. The advent of the seed and manure drill has, in many places, completely revolutionised farming, and land that was thought to be impoverished has, by the judicious application of artificial manure, been brought to a high state of fertility. It is safe to state that the practice of using these manures will be continued in the future. A good deal has been said about the analysis of the soil, and the most suitable manures for different soils. While this might prove of some value, the best guide will be the results of practical tests with different manures. The practice of experimenting with manures and different varieties of wheat is being adopted by many farmers, and, apart from the knowledge gained, proves interesting. It is said that electricity has been applied to the soil with encouraging results, and has been mentioned as likely to play an important part in the production of crops; but this, no doubt, belongs to the distant future, and is not likely to be brought into general use for many years to come. The farmer of the future will pay more attention to the thorough cultivation of the soil. It has been said that their forefathers scratched the soil. Many among them now merely skim it; but their successors will dig it in earnest. The area under fallow is increasing year by year: in the near future this is going to receive more attention. Farmers are finding out that it is better to crop less and fallow more. The chief use of fallow is not only to liberate the plant food stored in the soil, but to conserve moisture. This is an important matter, especially in the dry districts with an uncertain rainfall, early, well-worked fallow often giving good results where late fallow

has been a failure. Some have advocated rotation of crops, and growing of summer fodder: these are all right where they can be successfully carried out, but in dry districts they would end in dismal failure. Irrigation is likely to receive more attention in the future than in the past, and where a good supply of water can be obtained at a reasonable depth a few acres of irrigated land would pay well. A good supply of green feed would be obtained for the cows, and besides increasing the yield of milk would lessen the danger of impaction. Then, again, a good supply of vegetables would be obtained for the home. Some of their natural grasses, on which stock depended for their winter food, are in many places disappearing, their place being taken by weeds. Some farmers, finding that they cannot depend on them for early feed, are sowing a portion of their farms with oats, or early varieties of wheat, which make earlier feed, and are safer to depend on than the natural grass. This plan is likely to become a general practice before many years. The question as to whether the farm of the future will be on a larger or smaller scale than it is now has often been raised. In some instances holdings will have to be made larger, as, owing to an insufficient rainfall, cereal crops cannot be depended upon. In these cases larger holdings will be necessary to provide the run for cattle and sheep. Mixed farming is likely to be carried on more extensively in the future than in the past. It is possible to have too much or too little land, and the one seems to be as big a drawback as the other. A small farm often takes the same amount of machinery and horses to work it as would be employed on one twice the size. On the other hand, the farmer with too much land is often a source of trouble to his neighbours. Having more land than he can properly manage, his fences are often in a state of disrepair; his stock allowed to roam about the roads, and often in his neighbours' crops. Then, again, they are often the breeding ground for vermin, causing the man who can manage his own considerable annoyance. There seems to be at present a desire for larger holdings. Farmers are selling their farms to their neighbours, and leaving the State. This may go on for a number of years, as long as suitable land is available in the other States; but when the whole of the agricultural land is selected, it seems that the closer settlement will follow. The population is still on the increase, and the cry is "Put the people on the land"; but the difficulty will be to obtain the land. The Government is assisting by the repurchasing of large estates, but should be careful not to purchase at too high a price, as a high rent would have to be paid in consequence, and people would find themselves better off without it. Rural life has attractions for all. That is amply proved by the thousands who are always ready to risk their all in an endeavour to become farmers. If they fail, it is not that farming is of no use as a business, but that their methods and knowledge are at fault. Agriculture is a business, and must be conducted on business principles.

Clare, December 23.

PRESENT—Messrs. Birks (chair), Kelly, Christison, Carter, Jarman, McCarthy, Kimber, Stuart, and Dall (Hon. Sec.).

BANDAGING CINCTURES ON CURRANT VINES.—The Hon. Secretary read the following paper, which was prepared by Mr. J. T. Hague:—The subject with which I wish to deal to-night is the bandaging of cinctures. I think this a very important practice, and should be included in the routine of vineyard work. There are a good many advantages to be gained by adopting this practice, especially in a dry season like the one we are now experiencing. Last season I noted the much quicker healing of vines which had cloth bands tied around the cinctures, and as a result I decided to bandage my vines with waxed bands, as they were cheaper, and quicker to put on. The result has been very gratifying, the cinctures covered with well-waxed bands having completely healed in 13 to 14 days; while vines alongside, and cinctured the same day, were only one-quarter to one-half healed over in 32 days. In cases where a part of the band came off, the healing took much longer where exposed; also where the bands were not waxed healing took quite another week. The cinctures were always moist under the bands, proving that the sap still flowed as usual, and was not checked completely, or lost through evaporation, as is done when the cinctures are exposed. I think the question of keeping up the cir-

culatation of the sap a very important one, and through the quicker healing the check will not be so severe, and, as a result, the tendency of the stem above the cincture to increase so much in size may be prevented. The canes will also probably mature better. The non-ripening of the canes is a very serious matter; I also think the fruit will be of a better colour and quality. I might mention that the standard sample of currants last year was from a vineyard in which the vines had been banded. Probably the quality would have been better had the bands been waxed. The cost is very small; labour and material will not amount to more than 6d. per 100 vines. The plan I adopted in waxing the bandages was to get the cheapest of calico, tear it into strips about half an inch in width, roll it up, and pin it, then boil in grafting wax until thoroughly saturated. Several members stated that they had tried this practice, and strongly supported Mr. Hague's contentions. Mr. Christison favoured waxing the calico before tearing it into strips, as it was only necessary to wax one side. Mr. Birks stated that covering the cincture with a waxed cloth resulted in a better sample of fruit: the berries did not grow so large, and ripened more evenly.

Minlaton, November 12.

PRESENT—Messrs. H. W. Martin (chair), Boundy, Correll, Vanstone, Anderson, Jas. Martin, A. and J. McKenzie (Hon. Sec.), and one visitor.

IMPROVING BUREAU MEETINGS.—Mr. E. Correll read a paper on, "Can Bureau Meetings be made more attractive?" He pointed out that it was frequently stated that the Bureau meetings were poorly attended, often a difficulty being experienced in obtaining a quorum. The natural result was that members who would otherwise attend regularly will stay at home, because they are doubtful of a meeting being held. Then, again, the young people were usually conspicuous by their absence. Most of them cannot be induced to attend the meetings; others that would perhaps do so cannot get away to an afternoon meeting, especially in the busy season. It often happened that the fact of the father being absent at a Bureau meeting rendered it necessary for the son to stay on the farm. Yet they particularly needed to interest the young men in the work of the Bureau. To his mind it was a question how much of the tendency of the younger generation to devote their spare moments to cricket and other sports was due to the fact that they were not given sufficient opportunity to interest themselves in other matters. He must also confess that the Bureau meetings were not always of a character to interest the young people; but this was a matter that rested with the members, every one of whom should take his share in the work connected with the Bureau. Many complained that they were not able to write a paper: but he was satisfied that, if they would make up their minds to do so, they would find they could from their own experiences write something of interest. He recognised that the Bureau was doing, and had done, much good work: but, at the same time, he thought they were not doing all they might to make their meetings attractive and interesting. First of all, he would hold the meetings in the evening, instead of in the afternoon, and would endeavour to arrange a good programme for each meeting. He would like to see the ladies present at the meetings, and matters connected with the management of the household discussed. The meetings might be improved if they had a little music and singing, by way of a change. All papers should be open to free criticism as to subject matter, delivery, etc. Some objected to a little criticism; those anxious to learn would welcome it, so long as it was of a friendly nature. Anything likely to wound the feelings of the speakers, or give offence to anyone, must, of course, not be permitted. He believed that the adoption of some such plan would pave the way to quarterly lectures or classes in different centres, attended by officers of the School of Mines and other educational institutions, which would be to the manifest advantage of the country districts. Considerable discussion ensued, but the majority of members were of opinion that Mr. Correll's ideas were not practicable at present.

MICE IN HAYSTACKS.—Some discussion took place on prevention of damage to haystacks by mice. Several members thought this could be secured by placing a layer of sheets of galvanised iron a foot or more from the bottom of the stack, with the ends projecting about a foot beyond the stack.

Morphett Vale, December 20.

PRESENT—Messrs. Goldsmith (chair), Hutchison, Jones, E. and J. Perry, Depledge, Pocock, Sullivan, Forsyth, and Anderson (Hon. Sec.).

ATTENDANCE OF MEMBERS.—It was decided to enforce the rule *re* striking off the roll the names of members absent from three consecutive meetings.

WEEDS IN CROPS.—Mr. Hutchison stated that in a crop of wheat on land infested by poppies he harrowed all but the headlands when the wheat was about 3 inches in height. The result was very satisfactory, the crop being free from weeds where it was harrowed.

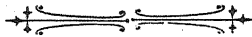
VEGETABLE-GROWING.—Mr. Hutchison tabled splendid samples of Purple-top and Swede turnips and tomatoes, grown after a crop of peas, which were manured with 2 cwt. per acre of superphosphate; the turnips received 2 cwt. per acre of boneash, and some of the Purple-top variety weighed up to 5½ lb.

SWINE FEVER.—In view of the outbreak of this disease near Adelaide, members wished to have information concerning the symptoms of the disease, and the precautions to be taken to prevent the spread of the complaint. [See pages 308-9 of December, 1903, issue of *The Journal of Agriculture*.—Ed.]

Cherry Gardens, December 13.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Brumby, Burpee, Richards, Jacobs, and Metcalf, and one visitor.

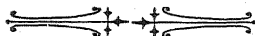
POTATOES.—Mr. T. Jacobs tabled samples of potatoes raised by himself. These were the fourth generation from seed, and gave promise of being a good variety, being prolific, and the sample first-class. Mr. Burpee read a paper on potato cultivation. He dealt at some length with the treatment of the soil, varieties to grow, depth to plant, etc. Thorough cultivation was recommended. He would cover the sets with 2 in. of soil; White Prolific was placed first as a general cropper for this district. Considerable discussion ensued, members generally taking exception to recommendation to plant only 2 in. below the surface. Mr. Jacobs said unless planted 6 in. deep the frost would reach most of the seed and prevent growth. Mr. Lewis advised covering with 4 in. of soil. Members generally considered that large potatoes cut into 2 oz. to 3 oz. sets gave the best results; but two members favoured uncut, round seed, especially for the summer crop. The Brown River potato was preferred by several to White Prolific. Members reported that right through the district the potato crops were exceptionally light, doubtless owing to the very dry season experienced.



MONTHLY RAINFALL.

The following table shows the rainfall for the month of December, 1904:—

Adelaide	...	—	Manoora	...	0.89	Echunga	...	—
Hawker	...	0.96	Hoyleton	...	0.35	Macclesfield	...	0.03
Cradock	...	0.83	Balaklava	...	0.10	Meadows	...	0.03
Wilson	...	1.00	Port Wakefield	...	0.07	Strathalbyn	...	—
Gordon	...	0.50	Saddleworth	...	0.72	Callington	...	—
Quorn	...	0.34	Marrabel	...	0.25	Langhorne's Bridge	...	—
Port Augusta	...	0.33	Riverton	...	0.11	Milang	...	—
Port Germein	...	0.10	Tarlee	...	—	Walleroo	...	—
Port Pirie	...	0.16	Stockport	...	—	Kadina	...	—
Crystal Brook	...	0.31	Hamley Bridge	...	—	Moonta	...	—
Port Broughton	...	0.21	Kapunda	...	0.04	Green's Plains	...	—
Bute	...	—	Freeling	...	—	Maitland	...	—
Hammond	...	0.36	Stockwell	...	0.01	Ardrossan	...	—
Bruce	...	0.36	Nuriootpa	...	—	Port Victoria	...	—
Wilmington	...	0.32	Angaston	...	—	Curramulka	...	—
Melrose	...	0.30	Tanunda	...	—	Minlaton	...	—
Booleroo Centre	...	0.22	Lyndoch	...	—	Stansbury	...	—
Wirrabara	...	0.17	Mallala	...	—	Warooka	...	—
Appila	...	0.14	Roseworthy	...	—	Yorke town	...	—
Laura	...	0.16	Gawler	...	—	Edithburg	...	—
Caltowie	...	0.19	Smithfield	...	—	Fowler's Bay	...	0.98
Jamestown	...	0.19	Two Wells	...	—	Streaky Bay	...	0.20
Gladstone	...	0.25	Virginia	...	—	Port Elliston	...	0.06
Georgetown	...	0.39	Salisbury	...	—	Port Lincoln	...	—
Narridy	...	0.61	Tea Tree Gully	...	—	Cowell	...	0.09
Redhill	...	0.95	Magill	...	—	Queenscliffe	...	—
Koolunga	...	0.55	Mitcham	...	—	Port Elliot	...	—
Carrieton	...	0.88	Crafers	...	—	Goolwa	...	—
Eurelia	...	0.90	Clarendon	...	—	Meningie	...	—
Johnsburg	...	0.81	Morphett Vale	...	0.03	Kingston	...	0.08
Orroroo	...	0.47	Noarlunga	...	0.02	Robe	...	0.05
Black Rock	...	0.51	Willunga	...	0.04	Beachport	...	0.03
Petersburg	...	0.26	Aldinga	...	0.03	Coonalpyn	...	—
Yongala	...	0.13	Normanville	...	—	Bordertown	...	0.01
Terowie	...	0.15	Yankalilla	...	—	Frances	...	0.03
Yarcowie	...	0.10	Eudunda	...	0.42	Naracoorte	...	0.05
Hallett	...	0.15	Truro	...	0.01	Lucindale	...	0.07
Mt. Bryan	...	0.25	Palmer	...	—	Penola	...	0.10
Burra	...	0.63	Mount Pleasant	...	—	Millicent	...	0.03
Snowtown	...	0.15	Blumberg	...	—	Mount Gambier	...	0.10
Brinkworth	...	0.30	Gumeracha	...	—	Wellington	...	—
Blyth	...	0.24	Lobethal	...	—	Murray Bridge	...	—
Clare	...	0.20	Woodside	...	—	Morgan	...	0.52
Mintaro Central	...	0.45	Hahndorf	...	—	Overland Corner	...	0.83
Watervale	...	0.35	Nairne	...	0.02	Renmark	...	1.18
Auburn	...	0.71	Mount Barker	...	0.05			



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RICHARD BUTLER,
Minister of Agriculture.

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EDITORIAL.

In taking over the control of the publication of *The Journal*, it is but fitting that recognition be made of the manner in which the work has been carried on for some considerable time by Mr. Summers, often under anything but the best of conditions. That he has done the work well is testified to by the confidence he has had placed in him by the readers. It will be noted that this month's issue appears under a new title—*The Journal of the Department of Agriculture of South Australia*. As the title implies, *The Journal* will be the official record of the Department's work, and, although the final editing and control will rest with the Secretary of Agriculture, it will nevertheless be the joint production of the officers of the Department, and whatever success *The Journal* may attain to will be due largely to their efforts. Under the new conditions it is anticipated that *The Journal* will cover a wider scope of work, and that its value will thereby be enhanced.

GENERAL NOTES.

Reclaiming Swamp Lands.

On January 25 the Hon. Minister of Agriculture, the Professor of Agriculture, and the Surveyor-General paid a visit of inspection to the swamp lands near Murray Bridge, which have been reclaimed by Messrs. Cowan and Morphet Brothers. The visitors were much impressed with the wonderful producing capabilities of this land. The swamps adjoining Murray Bridge which are to be reclaimed by the Government and cut up into blocks for leasing were also inspected, and the Hon. Minister announced that a block of twenty to forty acres would be allotted to the Department of Agriculture for experimental work.

Specially Graded Seed Wheat.

The Agricultural College has for sale specially graded seed of the following varieties of wheat:—King's Early, Bearded Innominate, Gluyas, Fan, Warwick, Jerkin, Majestic. Small quantities of other varieties are also available for sale. Particulars of prices, etc., can be obtained on application to the Secretary, Agricultural College, Roseworthy.

Rust-resistant Wheats.

Very favourable reports of the yielding qualities of the Gallant, Majestic, Silver King, and Federation wheats come to hand from time to time. All these wheats are rust-resisting, and good varieties for hay. Messrs. Marshall Bros., of Templers and Wasleys, speak very highly of a comparatively new wheat, Yandillah King, which has done better than

any other variety this year on their farms. Bobs is a strong-floured, rust-resisting wheat, that has been strongly recommended of late years; but last season it has "shelled" badly, and growers should be cautious about sowing large areas with this variety. Comeback also has not done so well this season as anticipated.

Wheat from Tennant's Creek.

The Hon. Minister of Agriculture has received from Mr. R. W. Waddy, Secretary to the Deputy Postmaster-General, a sample of wheat grown at Tennant's Creek by Mr. James F. Field. Mr. Field writes that as an experiment he sowed a small quantity of very poor fowl's wheat in his garden at the end of March, and although it had only about an inch of rain, which fell in April, the plants grew to a height of about 3 feet, and matured a very fair head of grain. Mr. Field intends to grow a small plot next year, and irrigate it. The samples forwarded to the Hon. Minister carry a well-filled head, and the grain is plump and good. If wheat of equal quality can be grown on any considerable areas of land about Tennant's Creek and other districts of the Northern Territory, it will doubtless have a very important bearing on the question of the proposed transcontinental railway to Port Darwin.

Protecting Grain from Weevils.

In many instances the wheat of the 1903 harvest was badly attacked by weevils, and much loss in the stacks was the result. Weevils can, however, be easily dealt with where the grain is stored in barns that can be made fairly close. Bisulphide of carbon, the fumes of which are deadly to all life, is the cheapest and most effective agent in dealing with weevils. This liquid is usually described as colourless; but the ordinary commercial form used here for the destruction of rabbits, etc., has a distinct brownish colour. Bisulphide of carbon volatilises rapidly on exposure to the air at ordinary temperature, and, being heavier than the air, will sink through the mass of grain, destroying any insects present. In close bins or receptacles about $1\frac{1}{2}$ lb. of bisulphide to a ton of grain is sufficient; but in barns or bins that cannot be made airtight a larger quantity is required. Neither the fumes nor the liquid will in any way injure the grain; but, being poisonous, very great care must be exercised in the use of the bisulphide, and no one should enter any barn where it has been used until it has been well ventilated. Naked lights must not be brought near the liquid, as it is highly inflammable. The usual practice is to put the liquid in small, open vessels in different parts of the barn or bin to be treated.

Fodder Plants on Salt Land.

In many parts of the State there are large areas of so-called "salt patches," which produce but little feed of any value. The

experiments carried out last year at Yorketown indicate that much of this land can probably be utilised with profit to the owner. Rape, kale, mangolds, and saltbush did remarkably well on land very heavily charged with salt. (See page 217, November issue.) Rape and saltbush are particularly promising—the former, because it is the cheapest, and gives the quickest return—and the latter because, if properly treated, it will, when once established, give good returns for a number of years. Whatever crop may be tried on these lands, the cultivator must not forget that salt land should not be cultivated dry. Seed of both rape and saltbush should be sown as soon as possible after the first autumn rain. Rape should be drilled in at the rate of about 3 lb. per acre, with a little super added. Saltbush should be sown in rows about 3 feet apart, and barely covered with soil; in fact, if mixed with very old stable manure or leaf-mould, and sown on the surface of the land after it is broken up, it will probably do best.

Lucerne as a Catch Crop.

The practice of sowing a small amount of lucerne seed when drilling in the wheat crop is rapidly increasing, and is one that should receive the attention of every farmer in districts with a reliable rainfall. Instances have come under notice where the equivalent of a sheep to the acre was kept on fields in which lucerne was sown with the wheat in 1903. It is true that the summer of 1903-4 was unusually wet, and favourable for the growing of lucerne; but in average seasons the expenditure of 1s. to 1s. 6d. per acre for lucerne seed will be directly repaid many times over in the feed produced, besides which the stock will keep in better health. The important question of early feed for lambing ewes would be to a large extent solved, and the carrying capacity of the farm increased by the more general adoption of this practice. Even this summer, which has been unusually dry, the lucerne sown in this way will return a profit before the land is again required for cropping. About 1 to 1½ lb. of seed per acre is sufficient to sow with the wheat.

The Starling.

In Victoria there has been considerable discussion of late as to whether the starling is to be regarded as a friend or an enemy of the tiller of the soil. While it is unquestioned that they destroy a large number of insects, and in pastoral districts may be of considerable value in keeping down ticks, etc., the fruitgrower and vinegrower will not find much consolation for his losses in this fact. The depredations of the starling in the vineyards and orchards of this State are enormous, and without concerted action there does not seem any prospect of relief. In the South, at any rate, the farmer also suffers from the work of the starling, who is by no means averse to a feed of grain, and both barley and wheat are freely eaten.

Imports and Exports of Fruit.

During January the Inspectors under the Vine, Fruit, and Vegetable Protection Act have passed 9,789 bushel cases of fruits, 8 parcels of plants, and 4,231 packages of vegetables, for export to those States which demand certificates of freedom from serious plant diseases with each consignment. Imports to the extent of 4,960 bushels of tropical fruits and 57 parcels of plants were dealt with at the same time. Of these, 556 bushels of bananas were destroyed, and 2 packages of plants detained, owing to the requirements of the law not being complied with.

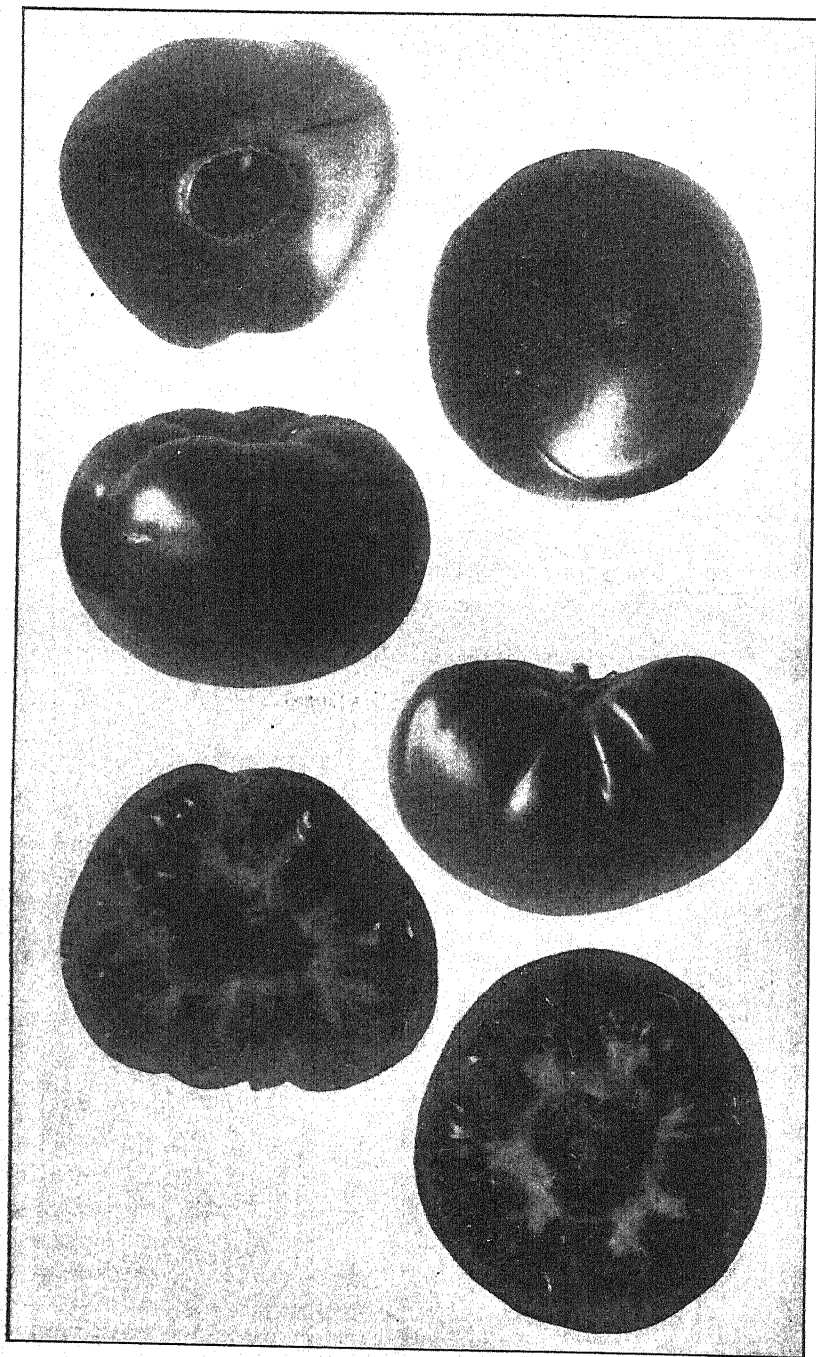
In the Stanley district, wherein fruitgrowing is carried on, Inspector Kelly has paid 119 visits of inspection to orchards and gardens within the seven days he has been at work during January. Mr. Kelly's report, on the whole, is favourable to the growers, most of whom are displaying commendable efforts to destroy the codlin moth and woolly blight in their plantations. In these attempts they are apparently well supported by the exceptionally hot weather experienced during the present summer.

THE PRODUCTION OF EARLY TOMATOES.

By GEORGE QUINN, Horticultural Instructor.

During the last ten years the production of early-ripening tomatoes has become quite a special branch of market gardening as carried on in our suburban areas. The amount of care and skill bestowed upon the production of this fruit probably approaches nearer to the close attention lavished upon small crops by the European gardener than anything else raised by our commercial horticulturists. The tomato flourishes out of doors in our State, and comes to as great perfection with a minimum amount of attention—beyond watering—as is possible in any part of the world; but when grown as herein described much care and skilful manipulation become necessary. The greatest quantity of early fruits is produced along the flats near to the Torrens and Sturt Rivers, at Fulham, Findon, and Marion chiefly. As a rule, these localities yield earlier fruits for the market than the plantations along the upper banks of the Torrens, at Marden, Paradise, or Athelstone. The explanation is probably found in the modifying effects of the sea air, and the consequent absence of late spring frosts in the first-mentioned localities.

The kind of tomato mostly grown is of local selection. It possesses the solidity of flesh and smoothness of skin and colour of the well-known Acme, but its outline is more flattened at the stalk end, and it is distinctly crumpled in the region of the flower end. In sowing the seeds, no particular care is taken in selecting the earliest ripened fruits, but good



Types of Early Tomatoes, grown around Adelaide (reduced one-third).

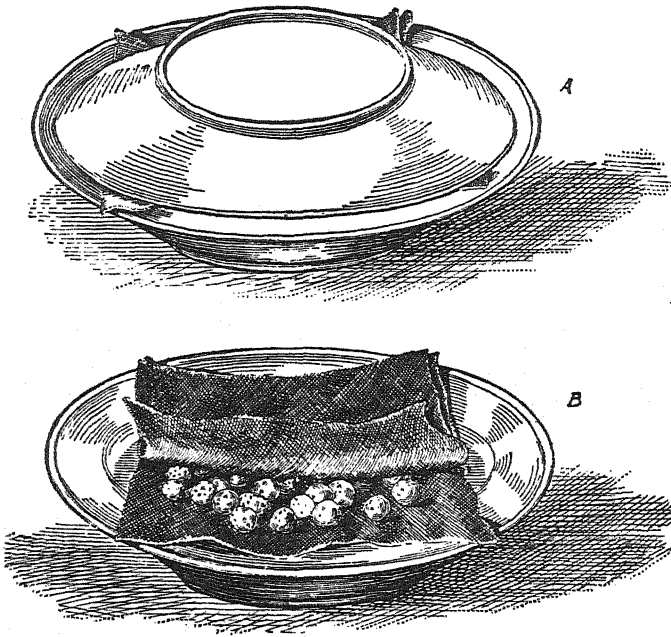
types of fruits are collected from plants that have proved their fruiting and growing qualities through the season.

On this point, the results of experiments made for three years in the United States, at the Cornell, Michigan, and Texas Experimental Stations respectively, with seeds taken from the first fruits which ripened upon tomato plants, are of interest. At Michigan during the first two years a slight gain in earliness of the crop was noticed, but it was observed that while this gain was considerable in the case of varieties of the angular type, it became a loss when the smooth, apple-shaped sorts were considered. In the third year the average of 15 varieties was $143\frac{3}{4}$ days from seed to maturity, and $145\frac{3}{4}$ days for the main crop, but, as in the case of the previous years, the smooth sorts showed a loss in earliness. The Cornell experience showed "the poorest results were got from the seeds of the earliest fruits, and there was no difference in the dates of the first picking. In our experiments last year there was no constant difference between the sets in point of earliness. This illustrates the law that any fruit reproduces its parent rather than itself; that is, the character of the plant as a whole is more important than the character of any individual fruit upon it. We should, therefore, expect better results by selecting fruits from an early plant rather than by selecting early fruits from an ordinary plant." "This may be summed up by saying, 'Choose vigorous plants which promise an early, even crop of good fruit, and mark them. Let the earliest fruits go to market and fetch the best price, but keep the later fruits from these plants for seed purposes.'"

In the production of crops to supply the early markets every possible delay should be avoided. When the grower saves his own seeds from year to year there is not much trouble respecting their germinating powers, but seeds introduced from elsewhere are open to question. In such cases, where the grower is quite dependent upon strange seeds, he should germinate a given number artificially before making a general sowing. This is readily done by procuring two dinner plates and a piece of thick, undyed flannel cloth or blanket. The cloth is wetted and wrung out before being spread upon the plate. A given number of seeds, say, 100, are counted out and spread upon half of the cloth, which rests in the bottom plate. The remainder of the cloth is then gently folded over the top of the seeds, so that they rest between two layers of it. The second plate is then placed upside down as a cover upon the lower one. This germinating apparatus should then be stood in one of the living rooms—say, the kitchen, in a warm, dark corner—which maintains a temperature of between 70° and 80° Fahr. If the cloth dries out too quickly moisten it by pouring a little rain or soft water into the bottom plate, from whence the cloth will absorb it. The seeds should germinate in eight to twelve days. As they germinate pick out the growing ones, and keep a record of the number taken out each day.

Fully 85 per cent. should germinate in this manner from a fair sample of seeds.

Around Adelaide the seeds are sown in June, which is before the midwinter temperature reaches its lowest stage. In consequence of this, artificial heat is absolutely necessary for tomato plants. This is invariably supplied by means of the common form of hotbed, warmed by the slow combustion or fermentation of manure. Several methods are in vogue. Some growers place their frames upon the top of a pile of manure standing in the open, but the majority adhere to the well-known



Seed-germinating Apparatus (after Yearbook U.S.A. Department of Agriculture).

pit system of making hotbeds. The first method is wasteful of heat, but it has the advantage of portability, as the frame may, if necessary, be readily shifted on to a fresh heap of manure when the heat declines in the first one. In the pits the manure is usually placed to a depth of two feet—a good thick layer, which will ferment not too rapidly. This slow action is best maintained by procuring a medium consisting of about three parts pure horse dung and two parts short straw litter. This should be turned and mixed several times for two or three days before it is packed into the pit. If it is dry, water should be sprinkled over the mass during this turning process until the whole be wetted throughout. The manure should be packed evenly in the pit, and stamped down firmly, to secure evenness of warmth. A layer of soil should be

then spread upon the manure. If the seeds are to be sown directly upon the bed, this soil should be not less than four inches thick, but if they are to be sown in boxes, two inches will suffice.

The soil for seed sowing need be only moderately rich and free, say, an admixture of rotted manure, one part; sharp sand, one part; good loam, two parts. It should be sifted or pulverised finely and pressed firmly and evenly on the surface. The surface of the seedbed or box is

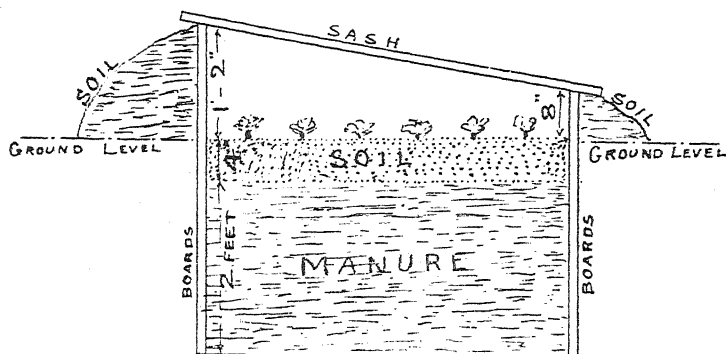


Illustration showing the manner of making the hotbed when sunk below the surface of the ground.

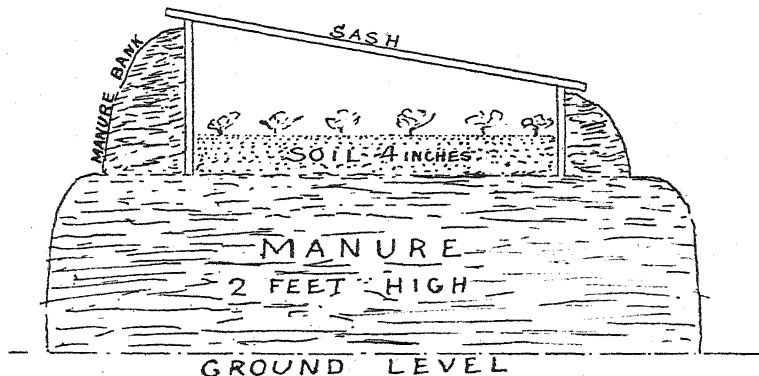
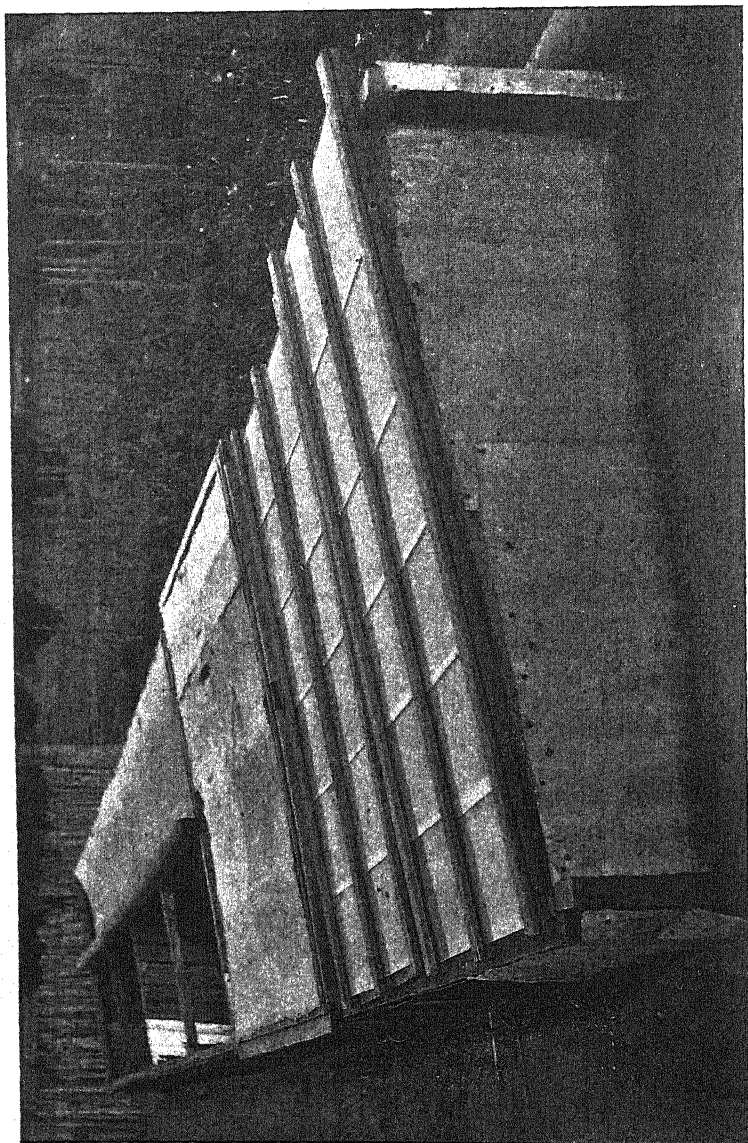


Illustration showing the manner of constructing a hotbed above the surface of the ground.

made quite level, so that when water is applied with a rose on the watering pot the soil or seeds will not be liable to wash into lower spots or corners. The seeds should be pressed into the soil with a flat board; and a sprinkling of finely grated manure or sand be covered over them, say, to about three or four times their own thickness when lying on the flat side. If the soil be fairly dry a light watering ought to be given when the sowing is completed. If the manure undergoes very rapid fermentation the temperature inside the frame will rise quickly, and this should be



Home-made Forcing Frames, showing glass, calico, and hessian covers.

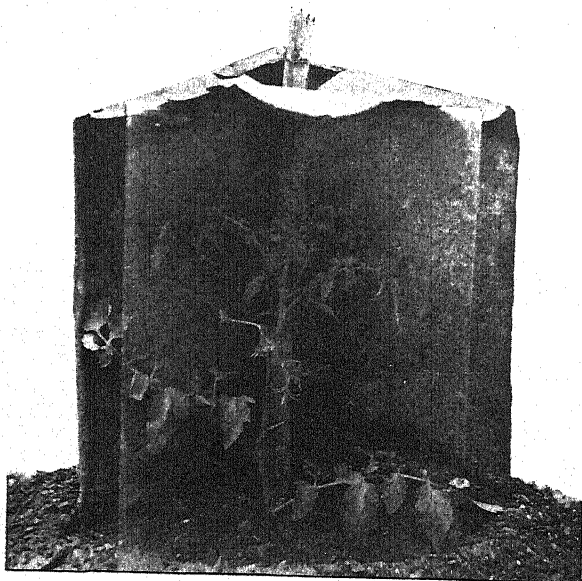
regulated by raising the cover to permit the heat to escape. If the sash be glazed this precaution is much more necessary than when calico is used. It is a very good plan to allow the bed to stand a day or two before the seeds are sown upon it or the boxes placed inside of the frame. The boxes, though a little more trouble to prepare, have the great advantage of being movable. They may be raised close to the light or sunken away from it at will, or they may be taken from one frame to another should the heat become too great or decline too low.

The frames may be kept in perfect darkness until the tomato seeds start to grow, but great care must be taken at the germinating time, or the seedlings will be suddenly drawn up, and, being too weakly, many will succumb. Great care is required in applying water, as the seedlings are so easily "damped" off at the ground line in cold weather if the soil around them is too moist. This defect is best avoided by applying water only when absolutely necessary, and then in the morning, and by allowing the moisture-laden air to escape from the frame during the milder parts of the day, by raising the upper end of the sash slightly, say, between 10 a.m. and 3 p.m. throughout the winter on all excepting the more inclement days. Avoid sprinkling the water over the young plants or on the frames. At night it will be necessary to cover the frames securely with bags or mats, to guard against frost, but these covers must not be put on until sunset, and should be removed at daylight. Attention to such details will result in sturdy plants being produced.

When the young plants have developed from four to six leaves they should be potted off singly into 4-inch flower pots (the homely jam tin with punctured bottom will do), or "pricked out" into boxes, allowing the plants to stand about four inches from each other. The soil used should be a little richer than that of the seedbed, and the addition of a sprinkling of superphosphate into the potting compost will prove of value. The young plants should be watered as soon as potted off, and then be put back into a warm frame again, the sash of which must be kept closed for a day or two to maintain an even temperature. When the plants no longer wilt they are improved by receiving abundance of air and light, and as the winter days begin to lengthen, the sashes may be removed during the milder portion of the day. This should be a gradual process, extending from the mere lifting of the higher end of the sash for a couple of inches at first, until, after the lapse of a few weeks, the cover may be completely removed during the greater portion of any ordinary day. This is known as the "hardening off" process, and results in the accumulation of fibrous tissues in the stems and an increase in the chlorophyll in the leaves of the plants, rendering them better fitted to withstand the greater stress of outdoor existence. As the days grow warmer, preparations are made for planting them out into the open ground. The soil for tomato growing needs to be fairly rich, but at the same time the rank, forcing power of fresh farmyard manure

is not desirable. A plot which has been heavily manured with dung during the previous year and has since carried a crop of cabbages or other rank-growing vegetation, if dressed with superphosphate at the rate of about 6 cwt. per acre, or 2 oz. to the square yard, will prove most suitable. Rich, damp soils, plentifully supplied with organic nitrogen, tend to produce much leafage and stem growth, but are directly opposed to the setting and maturation of early fruits. A good average sandy loam treated as above proves very suitable to the growth of the tomato. The soil must be ploughed or dug deeply, say, 10 to 12 in. at the least, and pulverised down to a fine condition of tilth. As the plants require irrigation, the surface of the garden must be graded to a gentle fall, in preference to a level, and all hollows should be filled, to prevent the lodgment of too much water in any particular spot.

The rows are set about 4 ft. apart, and the plants are usually placed not less than 3 ft. from each other in the rows. If the stakes are available they may be driven into position, and the plants set against them afterwards. The stakes found most serviceable here are made of jarrah, 1 in. square, sawn into 4-ft. lengths, and pointed. The common bamboo reed (*Arundo donax*) is also used, but it is scarcely rigid enough, and rots away in the ground rapidly under the influence of summer irrigation. The pot-grown plants are found at the transplanting period to be



Tin Shelter, with glass front, as used for protecting newly set out tomato plants.

superior, as they do not wilt and lose ground as do the open-rooted ones. If rain is not falling at the time, each plant should receive sufficient water to settle the soil around the roots immediately after being transplanted. The plants at this stage require shelter from cold, cutting winds, heavy rains, and possible frosts. A very ingenious, effective, and cheap shelter has been adopted here. It consists of bisecting an empty kerosine tin lengthwise along two of its diagonal or opposite edges, and cutting the ends in such a manner as to leave the top of the tin attached to one half and the bottom to the other. This is used as a roof, which projects above the plant. A hole is cut through this lid in the angle where it is attached to the other portion of the shelter. When the young plant is set out, this shelter is placed over it by passing the stake through the hole in the roof portion, and pressing the lower edge of the shelter into the soil in such a position as to effectively protect the plant from the cold, cutting south-west and south-easterly winds. The sunny



Tin Shelters, stacked for future use, against bamboo windbreak.

side is open, but a pane of glass is placed in front of the plant, which assists in keeping up a warm, even temperature, as well as admitting abundance of light. As the plant grows it is tied to the stake, and when its top reaches the roof of the shelter the latter is raised or removed altogether, by simply sliding it up and off the stake. As a rule, by this time the danger of frost is past, the glass has been removed, and the shelters may be taken away and stacked for future use, as shown in our illustration. Besides these tin shelters, the growers usually erect at short intervals bamboo or shingle fences across the line of the prevailing winds.

As the young plant continues to grow, its leader is tied to the stake, and all lateral leaf shoots are suppressed by being pinched out of the axils of the leaves. Some growers permit the three first formed lateral shoots to remain upon the stem. The fruits from these, as a rule, are a little later and inferior to those emerging from the main stem. Such fruits are sold to the factories after the market has become glutted. It is claimed that more produce is taken from the plot while under the tomato crop by this method of training, but, as far as I am aware, no fixed tests have yet been made to demonstrate this to be so. Against this, it may be urged that when trained to single stems the plants may be set closer to each other.

In connection with the pruning and training, it will be observed from the accompanying illustration that, while the growing shoots emerge in the ordinary manner from the axils of the leaves on the main stem, the flowering shoots arise from the stem on the side opposite to a leaf. Like the inflorescence of the grape vine, the fruit-bearing growth of the tomato is quite distinct from and devoid of leaf growth. In training to a single stem, all leafy side shoots are pinched out as soon as noticeable in the axils of the leaves, and the main stem encouraged to ascend until three good fruit clusters, or "hands," are developed. The terminal bud is then pinched out of the leader itself, and the sap thrown down, as it were, into the fruit clusters and the leaves on the stem. This causes the leaves to increase in size and become thick and fleshy. The pruning alluded to permits abundance of light to fall upon the fruits, and allows a free circulation of air between the plants, which dries up the surfaces of fruits and foliage, and tends to restrict the chances of insect and fungoid pests.

Up till the time the first fruits are gathered cultivation is essential. After each heavy rain shower or irrigation the soil between the plants should be stirred to a depth of about three inches, otherwise soil stagnation ensues, and growth is retarded. Where irrigation is practised experience has shown that the plants do best when the soil is ridged along the lines of planting, leaving shallow trenches between the rows, down which the water is run. Excessive watering should be avoided.



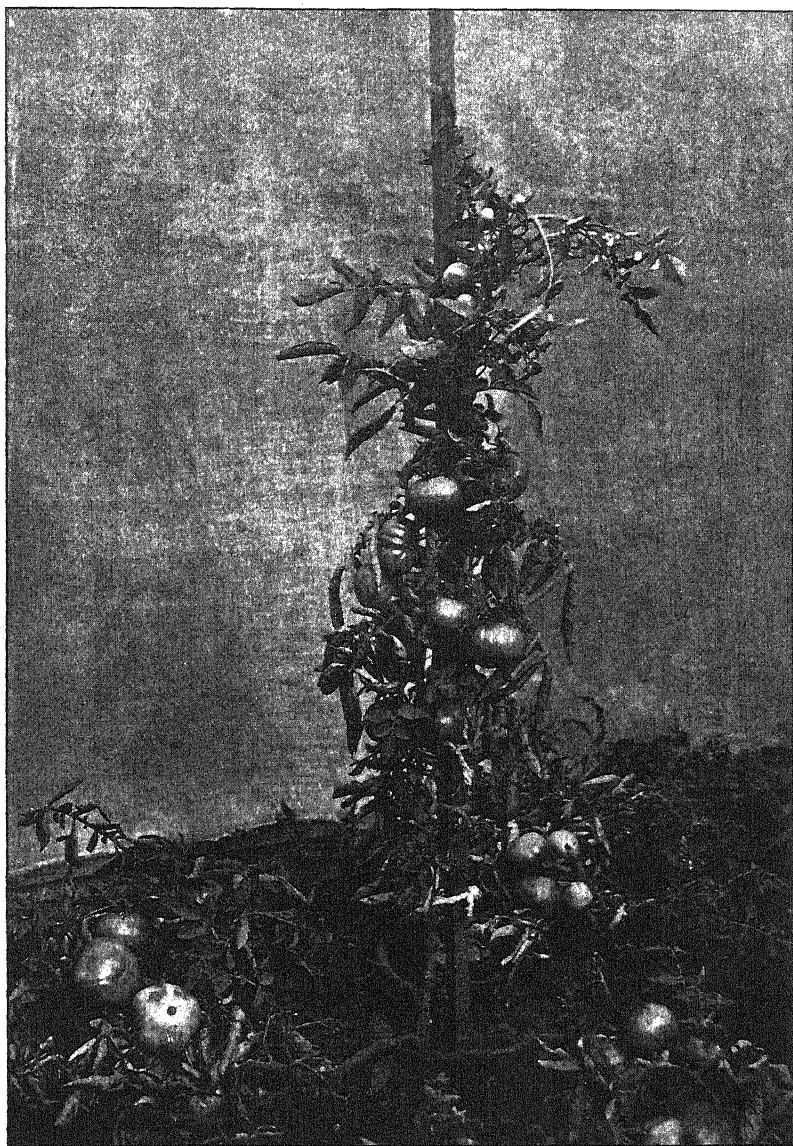
Sketch showing the relative positions of the lateral shoots A and the flower shoots B, on a tomato stem.

If the plants have begun to bloom before being planted out the fruiting habit is more or less assured. When first set out they are watered, and, with judicious cultivation during ordinary spring seasons, further watering should not be needed to any great extent for several weeks. The best guide is to be found in the growth of the plants. If this is continuous, but not rank, the plants are progressing all right. With the tomato, as with all other fruit-producing plants, we should never forget that an excessively vigorous habit of growth is not compatible with prolific fructification. The plants should grow steadily, without receiving checks or flushes to the growth, but after securing a good setting upon three or four clusters of flower shoots water may be more generously applied. By observing these points, and not forcing dense, umbrageous growth, or allowing periodical checks, the shedding of flower buds can be largely averted.

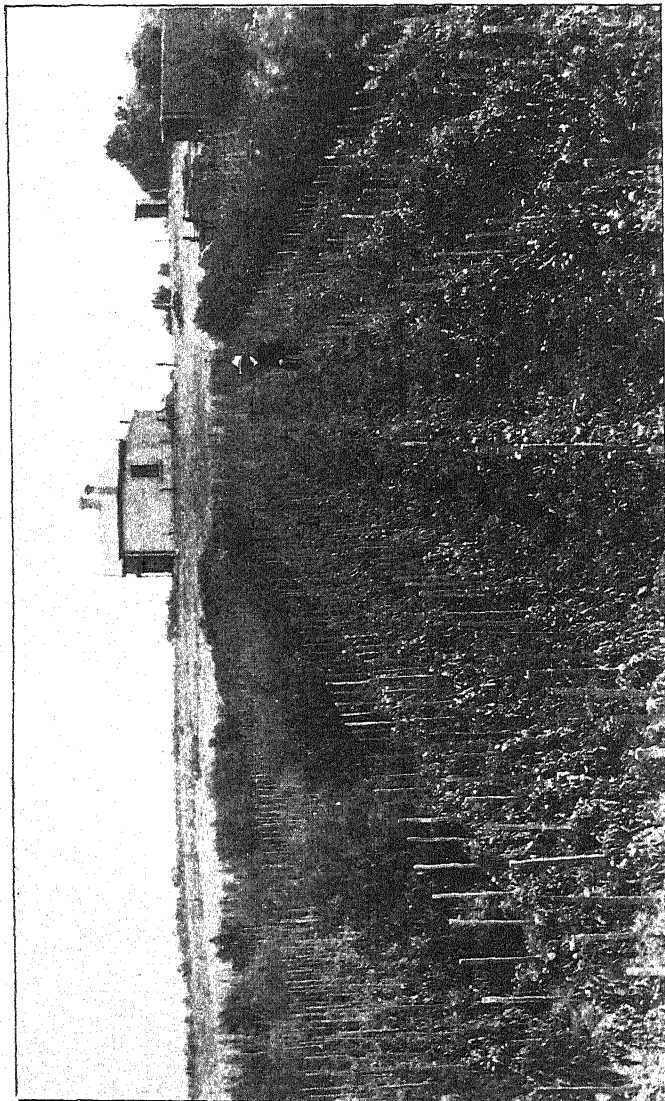
When the tomato is grown in the manner described herein, it is not, in our climate, very subject to diseases or insects. Among the former we have the fruit rot (*Macrosporium tomato*), which causes the ripe fruits to rot at the flower end. This, however, rarely takes place when the fruits are elevated up into the air, and when the plants are not over-stimulated by nitrogenous manures or excessive waterings. Sprayings with Bordeaux mixture are recommended against this fungus. These should be given more as a preventive than curative measure, and consequently must be applied before the rotting spots are apparent.

Two insects are troublesome here. The first is a caterpillar belonging to a species of *Agrotis* moth, and is known locally as a "cut worm," which eats the stem through about the ground level, causing the plant to break off. The second is also the larva of a moth known as *Heliothis armigera*, *Hubn.*, or tomato moth, which tunnels into the fruits at all stages, and renders them valueless for table purposes.

The method of prevention usually adopted by the tomato growers for the destruction of the dark brown cut-worm consists of digging them from out of the soil around the stem of the plant, where they hide during the day time, as they are nocturnal feeders only. This caterpillar attacks many plants other than tomatoes in a similar manner, and it has been most effectively dealt with in vineyards, and even in onion gardens, by the use of a poisoned bait, made of bran, paris green (poison), and treacle or coarse brown sugar. The proportions are:—30 lb. bran, $\frac{1}{2}$ lb. paris green, and about 5 lb. treacle or brown sugar, with enough hot water to make an adhesive mass. A lump as big as a pigeon's egg is placed near to the stem of each plant where the caterpillars congregate. They show a wonderful liking for it, and even when dried up will eat it in preference to almost anything. The *Heliothis* caterpillar is first green in colour, but afterwards, as it approaches maturity, changing to a dark chocolate tint. When full grown it enters the soil to pupate, and from thence the light grey coloured moth



Type of Tomato, showing one central and three lateral branches.



Bed of Early Tomatoes, illustrating method of training on stakes.

emerges to deposit its eggs on the plants. It is most destructive in the spring and early summer. It flies in the late afternoon and evening, depositing clusters of from two to six eggs on the under sides of the leaves. The eggs are yellowish-green, and are readily detected. The growers here adopt the plan of gathering the leaves on which the eggs are found and destroying them. As the moths are most active when the tomato fruits are growing I am sure that arsenical sprayings could be applied with perfect safety, and with good results in checking the attack. The egg-gathering method, besides being tedious, can only prove a partial measure, as the moths breed on grass and weeds in the adjoining fields. If the headlands and plots are kept free of weeds, much refuge for these insects would be removed, and the attack averted to a certain extent; but, judging from experience with kindred insects, some method of spraying will alone prove thoroughly efficacious. By way of test, I would suggest that paris green, 1 oz., mixed in eight gallons of water, which contains the milk of lime from 1 lb. of freshly burnt quicklime, be used upon the plants until the fruits are half grown, or within, say, one month of being picked. Kedzie solution of sodium arsenite could also be used at the rate of one pint to 30 gallons of water, in which 5 or 6 lb. of freshly burnt quicklime has been slaked.

In conclusion, I wish to express my indebtedness to Mr. Edward Stanford, of Fulham, for permission to photograph the plants and appliances shown in the accompanying illustrations, and by the aid of which he has, by the exercise of considerable skill, secured such commendable results.

“JOURNAL OF AGRICULTURE.”

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The Secretary for Agriculture,
Adelaide.

CIDERMAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 676, of Vol. vii.)

CLEARING THE CIDER.

The next process in the manufacture is therefore to rack the cider, *i.e.*, to draw it off from the sediment or lees in the fermenting barrel into a clean barrel. This is done with the rotary pump. As in drawing off from the keeves, so also when racking, it is most important not to disturb the sediment on the bottom of the cask. Unfortunately, the U tube employed for removing the juice from the keeve cannot be inserted in the bung-hole of a barrel, so that it is necessary to employ some other means. We used a metal tube closed at the end, but having numerous holes drilled in the sides, about three to four inches from the closed end. A still better arrangement would be to have the end of the tube dipping into a long, cup-shaped vessel, so as to ensure downward suction of the juice into the cup during the time of racking. After racking, the juice appears to clarify more easily, though fermentation is not stopped. Before racking, the solid matter is generally kept partly in suspension by the carbonic acid gas which becomes attached to it. This is dissipated by racking, with the result that the particles now subside. Subsequent fermentation is slower, and though enough carbonic acid gas is produced to saturate the liquid, yet unless the temperature is high, and fermentation rapid, it does not again raise this deposited matter for some little time. A safety bung is inserted in the cask, and the juice carefully watched. If necessary, the juice is again racked, and sometimes it may be necessary to rack it a third time. Thus the chief object of racking is to clear the juice; a subsidiary object is to check fermentation.

Should there come a sudden spell of very cold weather, fermentation will be checked, and at such times the cider will often clear naturally. Old cidermakers watched carefully for this event, and immediately racked the cider, irrespective of its gravity or composition, and they did right. For subsequent fermentation would be slower and better under control. Excellent cider can at times be so made, and neither filtration nor any other proceeding is necessary in such cases. But the cidermaker of the future must not rely upon chance. He must be able to make good cider in spite of the weather, and, to do this, racking alone does not always suffice. In such cases, then, racking is only a preparatory step to filtration, or some other method of checking fermentation.

Some makers think it desirable to rack frequently, and to prevent further fermentation so far as possible by sulphuring the casks into which the cider is racked. In this way not only is the cider clarified, but the sulphur fumes (sulphurous acid) present in the barrel are, to a certain extent, absorbed by the juice, and act both as a preventive of

further fermentation and also as a preservative of the cider. Experiments have proved that sulphuring has two drawbacks. First, it gives the cider a peculiar flavour, at the same time destroying the fine bouquet, to retain which should be the primary object of the maker; secondly, should it fail to check fermentation, it frequently causes the production in the cider of sulphuretted hydrogen, which gives the liquid a most nauseating smell and taste. In fact, I attribute a large proportion of the "sick" cider, which is such a loss to makers, to this cause.

Where racking alone is depended upon to check fermentation, owing to the difficulty of getting the cider to clear naturally, many makers are in the habit of using finings. These are substances added to the cider prior to racking, in order to carry down the matter in suspension, or to cause a precipitate in the cider which will have this effect. Some manufacturers employ blood, others milk, others albumen, and others isinglass. The use of these finings is liable to injure the cider, either by adding to it some extraneous matter which it were better without, or by taking from it some constituent which it can ill afford to spare. Blood, milk, and albumen are liable to introduce into the cider organisms which are best kept out. The worst sample of oily cider I have ever seen resulted from an experiment made to clarify some cider with milk. That the milk was the cause is not certain, but such was the result. Milk is always likely to introduce the lactic acid organism into cider, and should the conditions be favourable to its growth the cider will certainly be spoiled. Blood and albumen are both liable to rapid decomposition, and if the organisms of decomposition or putrefaction gain access to the cider the result is a most nauseous, insipid drink. The clarifying power of isinglass and gelatine depends on the fact that these substances combine with tannin to form a voluminous flocculent precipitate, which on settling clears the juice. But they rob it of tannin, a constituent certainly most essential to the production of good cider, and one which, in many districts, needs to be added to rather than taken from the juice. These are the principal reasons which compel me to be averse to the use of finings. That good cider can certainly be made, even when they are used, I will not deny; but experiments at Butleigh with several of these finings, and with others which have been brought to my notice, have proved that in every case a better cider could be made without them. In all the experiments check samples were kept which had not been submitted to the particular treatment under investigation. The cider which had not been clarified with finings invariably proved superior to the cider which had been so clarified. The results of the experiments at Butleigh are, therefore, not in favour of either sulphuring or finings as a means of checking fermentation. But they are in favour of racking, and they demonstrate that it is more important to rack at the right time even than to rack frequently.

Whether the cider is to be only racked or subsequently filtered, the question of most importance is: When should this racking take place? Upon this subject much work has been done. The following considerations directed the experiments: There must be some definite basis to guide the operation if the work is to be done systematically. What should this basis be? I could only think of two possible means of judging when the cider should be racked: the first was, the clearness of the juice; the second, the extent to which fermentation had proceeded. The clearness of the juice will depend mainly upon the state of the weather, partly upon other causes not yet investigated. It will also depend upon the *kind* of fermentation which is taking place, but *not* upon the amount of fermentation which has taken place in the juice. Thus, in some experiments with pure cultures of yeast, the juice attained a clearness, even while the fermentation was proceeding, which no juice had ever acquired under ordinary conditions; and this occurred long before it would have been right to rack the juice. In other cases the cider would ferment down to dryness—that is, until no more sugar remained in the juice, and never clear. Hence, from the results of experiments it was evident that clearness was not a reliable guide as to the time for racking. The only other guide is the composition of the juice; in other words, the extent to which fermentation has proceeded. Experiments have been made to try and determine at what precise time during the fermentation it is best to rack or filter. If ease of filtering were the chief consideration, then it would be best to wait until the juice had fermented to dryness. But this has many disadvantages. One is that, during filtration or racking, the carbonic acid gas, which is dissolved in the cider, and which helps materially to preserve it, would be lost, and as there would be no sugar left for the production of more gas by subsequent fermentation, the cider would not only be flat, but it would not keep. Hence it is invariably necessary to rack and filter the juice before it has fermented to dryness. Now arises the principal problem. When? We may be guided by the amount of sugar which ought to be present in the juice to ensure sufficient subsequent fermentation for the cider to be bright or “in good condition” and to keep well. From the results of the experiments with pressure gauges, previously referred to, it would seem that the maximum pressure which a cask will withstand without leaking is about 2 lb. to the square inch. To obtain more carbonic acid than would yield this pressure would be of little use; so that if sufficient sugar could be left in the juice to ensure, by its subsequent fermentation, an amount of gas which would produce this pressure, this would presumably be sufficient for all practical purposes. What amount of sugar would be required to produce this result, owing to the solubility of the gas in the liquid, is difficult to determine with certainty. It seems to me that for this purpose it is necessary to have about 3 per cent. of sugar in the juice when it is racked or filtered and finally bunged down.

Another standard would be the quantity of alcohol in the cider. This is the standard which has been finally adopted, the results of experiments showing it to be the most satisfactory. The main reasons for adopting the percentage of alcohol as the best standard to guide the cidermaker in all operations subsequent to placing the juice in the fermenting barrels* are these: first, alcohol is a natural preservative, and if sufficient is present in the juice no other preservative is required; and, secondly, the greater the proportion of alcohol the slower will be any subsequent fermentation. But how can the ordinary cidermaker determine what amount of alcohol is present in his cider?

The question appeared to me of such importance that an attempt was made to solve the difficulty by preparing the tables on pages 365 and 366, based upon the results of several years' observations. To make use of the table it is necessary to employ an accurate hydrometer with which to determine the specific gravity of the juice from time to time. This instrument is, indeed, as necessary to the cidermaker as the thermometer is to the butter-maker. A book should be kept, and in this should be entered the specific gravity of the juice as it comes from the press, and of each barrel as it is filled from the keeve, the barrel being numbered at the same time. From time to time, as fermentation proceeds, some of the juice should be drawn off and the specific gravity taken. When the specific gravity is such that the table shows it to contain the amount of sugar or alcohol required at the time of racking or filtering, then this operation should be proceeded with at once. By the use of this table and a hydrometer cidermakers can conduct their operations far more thoroughly, accurately, and satisfactorily than has been the rule in years past; and they may rest assured of this: that the extra time and trouble will be well repaid by the more uniform and better character of the cider they produce, and also by its better keeping qualities.

One of the chief causes of so much inferior cider being produced is that makers neglect to rack the juice after it has been put into casks and before fermentation has proceeded too far. The cidermaker who would succeed must periodically, at intervals of not more than a fortnight, go round his cellar and carefully take the gravity of the juice in every barrel, and record it.† These figures will tell him which cask is fermenting most rapidly, and therefore which cask to rack first. Then, if a cold night and day come and check the fermentation, the skilful cidermaker will know which casks to rack at once, and will thus utilise the natural conditions which are favourable to his industry. The season 1899, for the reason that there were occasional spells of very cold weather, was an ideal one for cidermaking, and during the preceding six

* I use this term to distinguish them from the storing barrels in which the cider is finally placed.

† This can easily be done on the barrel in chalk, and subsequently it should be copied into a book.

years it had never been possible to control fermentation so thoroughly. Hence, some of the best cider produced at Butleigh during the course of these experiments was made in that year.

Let me here give an illustration of the use of the hydrometer and the following table in a bad season:—

November 5.—The juice was found to be at a temperature of 52° F. as it came from the press, and its gravity was ...	1·051
November 10.—First head formed in keeve and skimmed. Sp. Gr. of juice ...	1·047
November 11.—A white frothy head showing rapid fermentation removed and juice racked into barrels. Sp. Gr. ...	1·045
November 17.—Gravity of juice found to have diminished rapidly, so cider racked. Sp. Gr. ...	1·031
November 24.—Juice again tested and found rapidly fermenting, so racked again. Sp. Gr. ...	1·020
It ought to have been filtered now, but was not clear enough.	
December 1.—Juice again racked, and still not clear enough to filter, though Sp. Gr. had fallen to ...	1·013
December 9.—Juice had slightly cleared, enough to filter. Sp. Gr. after filtration ...	1·010
This cider was now bunged down, and partly saved from being too dry.	

Had it not been for the constant use of the hydrometer the cider-maker would not have known how to proceed, and the whole of it would have been spoiled.

Let me now take another illustration from a good year:—1899.

November 13.—Juice from press. Sp. Gr. ...	1·063
November 18.—First skim, good brown head. Sp. Gr. ...	1·057
November 20.—Second skim, white head, therefore racked into barrels ...	1·055
The fermentation was watched, and found to be proceeding somewhat rapidly, therefore on	
December 5 it was racked, gravity being ...	1·036
This checked the fermentation, and as the gravity did not diminish very rapidly it was not racked a second time until	
December 19, when the gravity was ...	1·030
Fermentation now proceeded still more slowly, and it was not fit to filter until	
January 3, when the gravity was ...	1·025
and the cider contained exactly 4 per cent. of alcohol.	

Table showing the Percentage of Sugar and Alcohol in Fermenting Juice, provided the Specific Gravity of the Original Juice is known.

PERCENT GRAVITY.

Original Gravity.	1025.			1020.			1015.			1010.			1005.			1000.			995.		
	Alcohol.			Alcohol.			Alcohol.			Alcohol.			Alcohol.			Alcohol.			Alcohol.		
	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.	Sugar.	By weight.	By volume.
1050	5.8	2.5	3.1	4.8	3.0	3.8	3.8	3.5	4.4	2.8	4.0	5.0	1.8	4.5	5.6	8.1	5.0	6.9	—	—	—
1051	5.8	2.6	3.3	4.8	3.1	3.9	3.8	3.6	4.5	2.8	4.1	5.1	1.8	4.6	5.7	8.1	5.1	6.9	—	—	—
1052	5.9	2.7	3.4	4.9	3.2	4.0	3.9	3.7	4.7	2.9	4.2	5.2	1.9	4.7	5.9	8.2	5.2	6.9	—	—	—
1053	5.9	2.8	3.6	4.9	3.3	4.1	3.9	3.8	4.8	2.9	4.3	5.4	1.9	4.8	6.0	8.2	5.3	6.7	—	—	—
1054	6.0	2.9	3.7	5.0	3.4	4.3	4.0	3.9	4.9	3.0	4.4	5.5	2.0	4.9	6.1	8.3	5.4	6.8	—	—	—
1055	6.0	3.0	3.8	5.0	3.5	4.4	4.0	4.0	5.0	3.0	4.5	5.6	2.0	5.0	6.2	8.3	5.5	6.9	0	6.0	7.5
1056	6.1	3.1	3.9	5.1	3.6	4.5	4.1	4.1	5.1	3.1	4.6	5.7	2.1	5.1	6.3	8.4	5.6	7.1	1	6.2	7.8
1057	6.1	3.2	4.0	5.1	3.7	4.7	4.1	4.2	5.2	3.1	4.7	5.9	2.1	5.2	6.5	8.4	5.7	7.1	1	6.3	7.9
1058	6.2	3.3	4.1	5.2	3.8	4.8	4.2	4.3	5.4	3.2	4.8	6.0	2.2	5.3	6.7	8.5	5.8	7.2	2	6.3	8.0
1059	6.2	3.4	4.3	5.2	3.9	4.9	4.2	4.4	5.5	3.2	4.9	6.1	2.2	5.4	6.9	8.5	5.9	7.4	2	6.4	8.1
1060	6.3	3.5	4.4	5.3	4.0	5.0	4.3	4.5	5.6	3.3	5.0	6.2	2.3	5.5	7.0	8.6	6.0	7.5	3	6.5	8.2
1061	6.3	3.6	4.5	5.3	4.1	5.1	4.3	4.6	5.7	3.3	5.1	6.3	2.3	5.6	7.1	8.6	6.1	7.6	3	6.6	8.3
1062	6.4	3.7	4.7	5.4	4.2	5.2	4.4	4.7	5.9	3.4	5.2	6.5	2.4	5.7	7.2	8.7	6.2	7.7	4	6.7	8.4
1063	6.4	3.8	4.8	5.4	4.3	5.4	4.4	4.8	6.0	3.4	5.3	6.7	2.4	5.8	7.3	8.7	6.3	7.9	4	6.8	8.5
1064	6.5	3.9	4.9	5.5	4.4	5.5	4.5	4.9	6.1	3.5	5.4	6.8	2.5	5.9	7.4	8.8	6.4	8.0	5	6.9	8.6
1065	6.5	4.0	5.0	5.5	4.5	5.6	4.5	5.0	6.2	3.5	5.5	6.9	2.5	6.0	7.5	8.8	6.5	8.1	5	7.0	8.7
1066	6.6	4.1	5.1	5.6	4.6	5.7	4.6	5.1	6.3	3.6	5.6	7.0	2.6	6.1	7.6	8.9	6.6	8.3	6	7.1	8.8
1067	6.6	4.2	5.2	5.6	4.7	5.9	4.6	5.2	6.5	3.6	5.7	7.1	2.6	6.2	7.8	8.9	6.7	8.4	6	7.2	8.9
1068	6.7	4.3	5.4	5.7	4.8	6.0	4.7	5.3	6.7	3.7	5.8	7.2	2.7	6.3	7.9	9.0	6.8	8.5	7	7.3	9.1
1069	6.7	4.4	5.5	5.7	4.9	6.1	4.7	5.4	6.8	3.7	5.9	7.3	2.7	6.4	8.0	9.1	6.9	8.6	7	7.4	9.2
1070	6.8	4.5	5.6	5.8	5.0	6.2	4.8	5.5	6.9	3.8	6.0	7.5	2.8	6.5	8.1	9.2	7.0	8.7	8	7.5	9.3

BLENDING.

The composition and value of cider will, in the first place, depend upon the composition of the apple juice from which it is made. It is evident that this in its turn will depend upon the season. But the object of the cider-maker must be to produce a uniform article every year, irrespective, so far as may be possible, of the composition of the apples. This can be done only by blending, and, if necessary, by adding sugar. All past experience at Butleigh, and the information supplied by exhibitors of cider at the Bath and West Society's Shows, indicate that the best cider is the produce of a judicious blend of apples. But before it is possible to carry out experiments systematically on the influence of blending, it is necessary to know the effect of each individual constituent of the blend.

A striking illustration of the value of selecting only a few varieties to blend was afforded at Butleigh in 1898. Not having then a sufficient number of apples of one variety to experiment upon, two varieties had to be blended, viz., Kingston Black and Red Jersey. The resulting cider was the best made during the season, and it kept perfectly, both in cask and in bottle, up to January, 1900.

In many cases it is found that a better product is obtained by blending three, four, or even five varieties, than by blending two only. No simpler illustration of the value of blending is afforded than by pouring out three or four varieties of cider into as many tumblers and in another tumbler placing a mixture of all in equal proportions. If a number of persons are invited to taste these samples, the majority will, as a rule, consider the blend is the best, although unaware of its composition. The fact is that in such a blend any striking excess or deficiency of acid, sugar, or tannin, which may be present in the various constituents is modified.

The art of blending is consequently one demanding considerable knowledge and skill on the part of the cider-maker. It demands, in the first place, a knowledge of the composition of the juice of each variety of apple which he employs; and, in the second place, of when and how to blend the juice, and in what proportions. Blending the apples presents many difficulties. Even if the composition of the juice yielded by each variety is known, the apples do not ripen all at the same time, so that some varieties would have to be kept in store too long waiting for others to be fit to grind. It is, therefore, best to grind each variety separately, or two varieties ripening about the same time together, and proceed with the juice of these varieties as previously described in this report, up to the time of racking. By judicious racking of this first produced juice, the fermentation may be checked, and meantime the fermentation of the juice of the one or two later varieties which are to be blended with it will be proceeding unchecked. In due time this also will be racked. It is at the time of this racking, or if this second juice is fermenting very

rapidly, which is not likely, as the season would be well advanced, then at the second racking, that blending should take place.

The blended juice should be racked once again before filtration, Never blend after filtration. In some respects the larger the blending vessel the better. But even those who have only the ordinary "pipes" may blend just as well by placing only the proper proportion of each juice in the pipes. The simplest method of doing this is to fix a stick in a large bung, so that the end reaches one-half or one-third way down the barrel, according to the quantity of liquid required, and then fill the barrel till the end of the stick is wetted by the rising cider.

In order to blend to advantage, four objects must be kept constantly in view:—

- 1st. Juice containing an excess of acidity, say, over 0.75 per cent., must be blended with juice deficient in acidity.
- 2nd. Juice deficient in tannin must be blended with juice rich in tannin.
- 3rd. Juice deficient in sugar (or its equivalent alcohol) must be blended with juice rich in sugar (or alcohol).
- 4th. Juice containing much extractive matter should be blended with juice from which these are absent.

A STANDARD OF COMPOSITION AND DILUTING THE JUICE.

The excellent results which have been obtained by judicious blending point to the desirability of each cider-maker fixing a "standard" composition for his cider, and of blending or diluting the entire juice until this standard is obtained. Not until this is done will it be possible for a cider-maker to produce a liquid which shall have the same uniformity as is now obtained in the wines of the leading manufacturers in foreign countries. So far as one can judge from hearsay, the chief reason why cider has not become a more popular drink has been the difficulty of obtaining it of uniform quality, flavour, and colour, and the only way to ensure this is by careful blending. Abroad a standard of somewhat low quality is often taken for ordinary cider. In other words, the juice before fermentation commences is diluted until it has a specific gravity or density of only 1.040 or 1.045. This dilution is not made by adding water, but by adding small cider to the original juice. The amount and density of the small cider made is carefully regulated so as to ensure the proper dilution taking place. The addition of water to cider is justly looked upon as a risky, if not dangerous, proceeding.

I do not attempt here to give any standard for cider. In my opinion each maker must try and work out for himself the standard which he can best attain to, with the fruit which he at present possesses. Subsequently, as his orchards improve, he may raise the standard. One of the chief difficulties of having a high standard is due to the variation in the quality of the apple juice which is the result of climatic conditions. Thus, in 1894 and 1902 the juice was of exceptionally poor quality.

Under such circumstances the only means of raising the juice to a high standard would be to add sugar. Experiments have been made on this subject, with the following results:—The best substance to use is pure cane sugar. Sugar candy, which is perhaps the next best material, gives a somewhat characteristic flavour to the resulting cider. I have experimented with several of the substances used by brewers, but have not been satisfied with the results. The quantity to use is found from the original gravity of the juice. Thus, if the original gravity represented 12 per cent. of solids and the standard adopted is 14 per cent., then 2 per cent. of sugar must be added. The addition of $5\frac{1}{2}$ lb. of sugar to a hog-head of juice is equal to an increase of 1 per cent. in the solids. The sugar may be added to the juice after it has been keeved and pumped into the fermenting barrels. It may be dissolved in a little of the juice before being added to the bulk, but this is not necessary. If the fermentation is very rapid, *i.e.*, in a warm season, the juice throwing up white heads, and the specific gravity of the juice from keeve much less than that of the juice from press, it is better to postpone adding the sugar until after the first racking from the fermenting barrels.

FILTERING THE CIDER.

After the cider has been properly blended and racked it should be filtered. Although with the Invicta filter it is quite possible to filter the cider without racking, yet the filter gradually becomes clogged and needs to be cleaned out too frequently, an operation entailing some time and trouble. But after proper racking, the cider is found to filter with ease, and much larger quantities can be filtered before it is necessary to clean out the filter. Care must be taken not to allow too much time to elapse between the last racking and filtering. Otherwise the production of gas will be sufficient to again raise the deposited material. The time to be allowed will depend mainly on the temperature, and the rate of fermentation in the cider; the more rapid it is the sooner should filtration take place. Hence, in racking prior to filtration, we must be guided by the gravity of the juice and the rate of fermentation. It is in order to determine these factors that samples of the cider are drawn from time to time and their gravity estimated.

The cider should be filtered so soon as it contains 4 per cent. of alcohol by volume. This conclusion has been reached after very numerous experiments, extending over several years. It applies only to cider made from juice the original gravity of which was not above 1.060. When the original juice has a specific gravity of above 1.060 it is best to allow it to ferment to 1.025 before filtration, unless it is intended to make very sweet cider or to keep it in barrel some long time before bottling; and even then it is a doubtful policy to filter when the gravity is too high. By the help of the preceding table on page 365 it will be easily discovered at what gravity each barrel will contain cider with 4 per cent. of alcohol, and should be filtered, and it is well to go round the cider cellar and

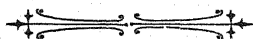
mark this filtering gravity in chalk on every barrel. By testing the gravity of the fermenting juice from time to time, it will be seen whether this is approaching the filtering stage rapidly or slowly. This is a most important point to determine. If the cider is fermenting rapidly then it will probably require to be racked two or three times: if it is fermenting slowly then one, or at most two, rackings may suffice. If it is fermenting rapidly then the first racking must be made when the gravity is still well above that desired, say, at 1·033, when the gravity desired is 1·025, but if it is fermenting slowly then the first racking may be postponed until the gravity is 1·029.

The rate of fermentation is discovered from the gravity as taken from time to time: as already described.

IS FILTRATION DESIRABLE?

The introduction of the filter was naturally looked upon by old and experienced cider-makers as a rash scientific experiment. They had made cider, and good cider too, all their lives "without that thing." Many were the ominous shakes of the head at each further step which the experiments took. At first it was going to take out of the cider all the "body" (whatever this may mean, for each person gives a different definition of the word), and great was the surprise when it was found that the filter did not have this effect. Next, it was declared that all the flavour would be removed. But this prophecy also proved false. In spite of these evil prognostications, Mr. Neville Grenville decided, having faith in clean cider, that, so far as possible, the cider of 1895 should be filtered and bunged down to keep to 1897. The filtered cider was subsequently tasted, and compared with that which was not filtered. It was found in 1897 to be excellent, and far better than the unfiltered. It was evident that if filtered cider in cask could go successfully through such a trying summer as 1896, there was little fear of its not keeping in an ordinary season. Experiments have fully confirmed the value of the filter. At present the cost of a good filter is prohibitive to a farmer. A cheap and efficient cider filter is greatly needed. Meantime, large landlords might do worse than purchase a filter and let it out among their tenants. It will not fail to materially improve the character of the cider, whether it be retained in casks or transferred to bottles.

(To be continued.)



ROSEWORTHY AGRICULTURAL COLLEGE NOTES.**EXPERIMENTAL VINEYARD.**

By H. E. LAFFER, Superintendent of Vineyard.

The season which opened so well has entirely changed, and now our vintage must be small. No rain fell after November 3, consequently the vines suffered a severe check. This dry spell, culminating as it did with the intense heat at the end of December, played havoc with the fruit, completely drying much of it up. The second heat wave, early in January, dried the grapes up still more. Notwithstanding the dry, hot weather, the ripening is a fortnight later than last year. Under present conditions the densities will be very high.

Currants set well, and showed a good crop, but birds have reduced it considerably. Starlings are present in great numbers, but bird-scarers keep them on the move fairly well. There are many smaller birds, however, which are not so easily frightened, and these prove a great nuisance where currants are concerned.

It has been necessary to water young trees several times in order to keep them going. Those which were established last year are doing fairly well. The fig is proving its hardiness and is doing well, but the trees which are most surprising are the pears. These have got a hold and are doing well, even on light limestone soil where stone fruits have died.

The rainfall for 1904 totalled 14.53 in., this being nearly two inches below the average. Temperatures ranged very high towards the close of the year, the last two days reaching 117° and 119° in the shade. This was followed by another spell early in January, four consecutive days going 112°, 117°, 116°, and 115° in the shade.

RAW LEMON JUICE.

The New South Wales Minister for Agriculture recently caused some inquiries to be made of Mr. Lance, Commercial Agent in London, regarding the prospects of a market for raw lemon juice, and that officer has now submitted some information on the subject. Raw lemon juice, he says, comes chiefly from Sicily, and is sold in pipes of 108 gallons. The demand is limited, is at the present time extremely bad, and is not expected to improve until the coming spring. The best juice on the English market is home squeezed, i.e., from imported lemons, the rinds of which are used for candied peel. It fetches a price of about 1s. to 1s. 3d. per gallon. Sicilian fetches from 9d. to 1s., and, as far as can be gathered, about 10d. would be the price that might reasonably be anticipated for any that came from New South Wales, provided it was of good quality. It is thought that the passage across the equator will be very trying, and fermentation would be likely to set in, especially if much pulp was left in it. Hence the necessity for the material to be thoroughly strained. At the same time, however, a little pulp left in the

juice is said to assist in maintaining its freshness. Mr. Lance was informed that the amount of acidity in the raw juice would not materially affect the price, provided it is not adulterated. It would be unwise to do more than send a small experimental package in the cold chamber at, say, 35°. There is, however, a steady demand for juice concentrated by evaporation, which mostly comes from the West Indies, and it seems to Mr. Lance that this is the form in which it would be the best for our producers to send it. The price is very low, especially at the present moment; but there would be no risk of loss by fermentation and leakage, and the market is much more reliable. The extent of concentration varies very much. The basis on which it is reckoned is 64 oz. of citric acid per gallon, which is about the consistency of the Sicilian, and this would work out at about a reduction to one-sixteenth, the acidity of raw juice being about 10 oz. to the gallon. The West Indian is usually double this consistency, and fetches a proportionately higher price. Mr. Lance thinks that if it was concentrated to 1 in 10 it would be satisfactory, and would be worth about 4s. per gallon. As regards the package, it is not thought that this would make much difference, and if barrels of 36 gallons were found more convenient, they might be used, but they must be good barrels. The West Indian growers concentrate four-fifths of their juice.

TWENTY YEARS' WHEAT IMPORTS INTO GREAT BRITAIN.

The cereal year 1903-4 has proved remarkable mainly for the unusually small proportion of our wheat imports furnished by the United States, although that country has not yet relinquished the first place it has held for so many years as a shipper of wheat and flour. In view, however, of the possibility of the loss of this pre-eminence during the present cereal year, it appears desirable to examine the progress of wheat production in those countries upon which we now mainly rely.

In 1883 the acreage under wheat in the United States was estimated by the Department of Agriculture at 36,456,000 acres. In 1903 the same authority puts it at 49,465,000 acres, an increase of about 36 per cent. The yield per acre quoted by the Washington Department would also seem to have increased from 12 bushels per acre on the average of the four years 1881-4 to 13.7 bushels on the average of 1900-1903. During this interval—converting the bushels into cwt. for purposes of comparison—the smallest estimated production has been 185 million cwt. in 1885, and the largest 388 million cwt. in 1901.

With such large variations in the amount produced, the quantities available for export, after the demands of a rapidly growing population have been met, naturally vary largely; and our total receipts of wheat and flour (in terms of grain) from the United States have ranged from

27,352,000 cwt. in the cereal year 1888-9 to 66,736,000 cwt. in 1900-1, with, on the whole, a general tendency towards an increase.

The United States ship a very large portion of their wheat to this country in the form of flour. This trade does not appear to be liable to quite such large fluctuations as that of the grain itself, although it naturally varies somewhat according to the harvest. The result is that, roughly speaking, the proportion of flour received here from the United States tends to rise when the total exports of grain and flour are small. In no cereal year has this been more conspicuous than in 1903-4, when we received only 12,897,000 cwt. from the United States in the form of grain, while 17,880,000 cwt. of wheat were required to produce the aggregate weight of the flour we received from that country. The amount of wheat reduced to the form of flour for export to this country has twice previously exceeded the quantity shipped in the form of grain in the past twenty years, viz., in 1887-8 and 1890-1. With a view of ascertaining the whole amount of our indebtedness to the United States for wheat the following table may be given, showing the total amount of wheat received from the United States, whether in the form of grain or flour (expressed in each case as grain), distinguishing the proportion in each category:—

TABLE I.

Imports of Wheat and Flour (Expressed as Grain) from the United States.

Cereal Years.	Amount Imported.	Proportion received as	
		Grain.	Flour.
	Thousands of cwt.	Per cent.	Per cent.
1884-1885	43,433	60.5	39.5
1885-1886	35,213	59.4	40.6
1886-1887	51,066	62.1	37.9
1887-1888	37,897	48.1	51.9
1888-1889	27,352	52.6	47.4
1889-1890	36,829	51.3	48.7
1890-1891	32,531	48.9	51.1
1891-1892	58,750	57.7	42.3
1892-1893	63,957	59.3	40.7
1893-1894	47,857	52.2	47.8
1894-1895	45,121	55.9	44.1
1895-1896	48,439	59.0	41.0
1896-1897	51,924	61.0	39.0
1897-1898	60,058	61.2	38.8
1898-1899	63,752	59.8	40.2
1899-1900	55,768	56.5	43.5
1900-1901	66,736	58.8	41.2
1901-1902	62,469	66.6	33.4
1902-1903	54,257	59.0	41.0
1903-1904	30,777	41.9	58.1

It is to be observed that the above figures of the amount received from the United States do not represent accurately the amount of wheat of United States origin, for the reason that there is a large cross-trade

between that country and Canada. What is precisely the effect of this transit trade it is difficult to say. The United States and Canadian statistics agree fairly in recognising that something over 2,500,000 cwt. of United States wheat intended for this country passed through the Dominion in the fiscal year (ending 30th June) 1903-4. On the other hand, statistics of the amount of Canadian grain transported through the United States for shipment to this country at Portland or some other Atlantic port—a trade which is particularly carried on during the winter—have been published by the United States Government since 1902. The quantity thus carried in transit to us in the fiscal year 1903-4 is given as 4,789,286 cwt. of wheat, and 349,000 barrels (equivalent to 841,339 cwt. of grain) of flour. So that of the receipts from the United States a net amount of some 2½ or 3 million cwt. should apparently be deducted from the exports of the last cereal year as being of Canadian origin.

Our imports of wheat from Canada have grown largely of late years, more especially since 1896-7, prior to which there had been comparatively little progress. The largest contribution—14,082,000 cwt. (including flour in terms of grain)—was received in the cereal year 1902-3, and that of last year amounted to 12,430,000 cwt.

Statistics relating to the agriculture of the whole Dominion of Canada are only collected in connection with the decennial census. In 1881 the area under wheat was given as 2,342,000 acres (yielding 17,330,000 cwt.); in 1891 as 2,701,000 acres (yielding 22,614,000 cwt.), while in 1901 it was returned as 4,225,000 acres (yielding 29,771,000 cwt.). As regards individual provinces, the chief wheat-growing area is now Manitoba, with, in 1903, 2,443,000 acres, as compared with 209,000 in 1883. The province of Ontario, which had 1,684,000 acres in 1883, has, on the other hand, in common with the East of Canada generally, steadily decreased its wheat production, and now has but 914,000 acres. This province bids fair to be shortly overtaken by the North-West Territories, which, in 1903, had 841,000 acres under wheat, against only 308,000 five years previously.

The chief competitor with the United States in shipments of wheat to Great Britain has been, as a general rule, Russia; although this country is an uncertain source of supply. Nor can it be said that, on the whole, it has of late years shown any continuous tendency to increase its exports, at least to the United Kingdom. The largest quantities we have received thence have been 24 million cwt. in 1888-9, and 23 million cwt. in 1894-5; while the 19 millions received in 1903-4 was no greater than the quantity received in 1889-90. On the other hand, poor harvests have resulted in our receiving less than 4 million cwt. in 1886-7, and in each of the four consecutive years 1898-9 to 1901-2. On three occasions during the past twenty years Russia surpassed the United States as a contributor of wheat in the form of grain alone; a circumstance which occurred again in 1903-4, when, however, Russia was herself surpassed by India.

The official Russian statistics suggest a large growth of the wheat areas. An enquiry in 1881 put the wheat area in European Russia (excluding Poland) at 28,947,000 acres; while in 1903 it is given as 43,755,000 acres. To this must be added the area in Poland, the Caucasus, Siberia, and the Asiatic Steppes, which together had 13,518,000 acres under wheat in 1903. The estimated production amounted in 1884 to 138,515,000 cwt. in Russia proper only, and to 242,774,000 cwt. (in the same territory) in 1903. In connection with the small growth of Russian exports to the United Kingdom, the effect of the growing demands of Russia's nearest neighbour—Germany—must not be overlooked.

The third country which during the period under review has contributed most to our supplies is India. This great dependency, owing to its climate, is at times subjected to severe fluctuations in its production which are naturally to a great extent reflected in its exports to this country, although it does not always follow that a yield above the normal will invariably result in a large exportation. The consumption of wheat in India appears, in fact, to be unusually susceptible to the variations in the price that may be obtained by exporting it to other countries. This is brought out by the following table, which shows the area, production, and exports of wheat from India during the past fifteen years. For the purpose of this table, the financial years ending March 31, which may also be looked upon as the Indian "export" years, have been taken; and the British Gazette price in the calendar years 1889-1903 has been added for comparison:—

TABLE II.

Area, Production, and Export of Wheat in India, and Gazette Price of British Wheat.

Years ending 31st March.	Area.	Production.	Exports in Following Year.		British Gazette Price of Wheat per Quarter.	
			Total.	To United Kingdom.		
	Thousands of Acres.	Thousands of Cwt.	Thousands of Cwt.	Thousands of Cwt.	s.	d.
1889-1890	24,773	122,460	14,320	9,271	31	11
1890-1891	26,576	137,520	30,307	13,866	37	0
1891-1892	24,482	110,700	14,973	9,926	30	3
1892-1893	26,429	143,860	12,157	7,429	26	4
1893-1894	26,778	135,420	6,890	5,088	22	10
1894-1895	25,994	125,586	10,004	7,736	23	1
1895-1896	23,242	110,219	1,911	1,506	26	2
1896-1897	19,024	97,857	2,393	1,079	30	2
1897-1898	22,954	133,735	19,520	10,674	34	0
1898-1899	23,923	126,792	9,704	6,549	25	8
1899-1900	17,183	97,394	50	7	26	11
1900-1901	22,922	135,314	7,322	4,879	26	9
1901-1902	23,447	121,270	10,292	8,894	28	1
1902-1903	23,092	155,322	25,911	19,733	26	9
1903-1904	27,773	187,750	—	—	—	—

There are in this table three years in which the exports were unusually heavy, viz., the financial years 1890-1, 1897-8, and 1902-3. In the first two of these years the price of wheat in Europe, owing mainly to shortages in the Russian or American crop of the previous season, was much above the average, and the Indian production was little more than normal, while in 1902-3 the Gazette price was under the average of the period and the Indian production was exceptionally heavy. Apart from the last two years, the largest harvest was in 1892-3; but owing to the low value then current, India apparently preferred to consume more of it at home. The smallest exports, on the other hand, were in 1895-6, 1896-7, and 1899-1900, all corresponding to years of very low production; the price in 1896-7 was, it is true, comparatively high, but there was clearly no wheat available for export. In another year, 1891-2, the preceding harvest had also been poor, but the price was sufficiently high to draw out an export above the average. It may, therefore, safely be concluded that the price which Europe is willing to pay is a very important factor in regulating the external trade of India, and that as much weight should be given to the values current as to the amount of the crop in forming any anticipations of the probable exports from that country.

Considering now the British cereal year, it may be remarked that 1903-4 is the first occasion on which India, with over 23 million cwt., has occupied the foremost place among the countries supplying us with wheat in grain, although it has not yet exceeded the amount of wheat and flour together from the United States.

Argentina has, during the past five years, sent us more wheat on the average than any other country except the United States. But it is only in comparatively recent years that it has come to the front, and the extension of its wheat area has been more rapid than in any of the other important territories contributing to our supplies of breadstuffs, while it is also probably capable of still further increasing this area more rapidly than other countries. Statistics for early years are mostly wanting, but official enquiries return the wheat area at 271,000 acres in 1875, 601,000 in 1883, 2,014,000 in 1888, 5,063,000 in 1895, and 8,348,000 in 1900-1, while the latest returns—for 1903-4—show 9,271,000 acres. The progress of the export trade has been equally rapid. It is only from 1891-2 that the imports of wheat from Argentina can be given for our cereal year, they having previously been grouped with "other countries" in the monthly trade returns. In that year, however, we received 2,692,000 cwt. Imports rapidly increased until they reached 14,106,000 cwt in 1894-5, then dwindled, and rose again to a maximum of 18,116,000 in 1899-1900; and, after a further fall to under 5,000,000 cwt. in 1901-2, recovered to 17,490,000 cwt. in 1903-4.

Two other sources of wheat, upon occasion, rise to considerable importance. These are Roumania and Australasia. Both are subject to climatic conditions that render them very unreliable sources of supply.

Our imports from the former frequently follow the movements of the Russian trade, though there are certain notable exceptions. The largest quantities received from Roumania have been 4,301,000 cwt. in 1890-1 and 4,536,000 in 1896-7; on the other hand, not a single cwt. was received thence in the season 1899-1900. Australasia, while capable of yielding much more than Roumania in good years, sent us absolutely nothing in 1896-7. Perhaps the most interesting example of wide fluctuations according to the season is to be found in the last three years. In 1901-2 we received from Australasia 6,799,000 cwt. (the maximum), in 1902-3 only 91,000 cwt. (the lowest but one), while in 1903-4 we had 6,570,000 cwt. (the highest after 1901-2).

It may be mentioned that we have occasionally received as much as a million cwt. from Germany, Turkey, Bulgaria, and, in earlier years, Chili.

The foregoing statements may conveniently be summed up in Table iii., showing the proportions of our wheat supplies received from the principal countries during the past twenty years. The figures refer to grain and flour together. The importation of flour from Russia, India, Argentina, Roumania, and Australasia has been ignored: the amounts received thence will not affect the percentages, except that the flour from Argentina (now amounting to 100,000 cwt. or rather more annually) would raise that country's quota by a decimal point in certain years.

TABLE III.

Percentage of Wheat (Grain and Flour Expressed as Grain) Imported into the United Kingdom from certain Countries to Total Imports.

Cereal Years.	United States.	Canada.	Russia.	India.	Argentina.	Other Co'ntries	Total.
1884-1885	53.3	3.0	11.8	12.3	—	19.6	100
1885-1886	50.9	4.1	10.1	17.6	—	17.3	100
1886-1887	64.9	6.6	3.9	13.6	—	11.0	100
1887-1888	49.8	4.6	20.0	8.2	—	17.4	100
1888-1889	33.7	2.4	29.8	11.9	—	22.2	100
1889-1890	45.1	3.4	23.3	11.6	—	16.6	100
1890-1891	40.0	4.5	19.8	13.4	—	22.3	100
1891-1892	59.2	5.2	6.4	15.8	2.7	10.7	100
1892-1893	66.1	5.7	8.4	5.8	6.2	7.8	100
1893-1894	49.8	4.6	17.2	6.6	12.2	9.6	100
1894-1895	42.3	4.3	21.5	7.1	13.2	11.6	100
1895-1896	50.2	6.4	18.9	5.0	6.3	13.2	100
1896-1897	55.9	6.3	16.6	.5	1.4	19.3	100
1897-1898	63.9	7.4	10.4	8.5	4.2	5.6	100
1898-1899	64.5	9.9	3.3	8.8	7.4	6.1	100
1899-1900	58.7	9.1	3.0	1.6	19.1	8.5	100
1900-1901	64.4	7.9	3.6	1.3	11.1	11.7	100
1901-1902	61.7	10.7	3.0	7.3	4.9	12.4	100
1902-1903	48.6	12.6	12.3	10.7	10.6	5.2	100
1903-1904	25.7	10.4	16.1	19.3	14.6	13.9	100

As regards our supplies during the current cereal year, 1904-5, the chief feature is the anticipated inability of the United States to furnish more than a relatively small proportion. The official United States *Crop Reporter* in May last put the area under winter wheat at about 27,083,500 acres, and the spring wheat area was returned in June at 17,141,000 acres, or 44,224,500 acres altogether. This is considerably below the area of 1903. Official figures regarding the yield have only been partially given. In August the amount of winter wheat was estimated as 173,000,000 cwt., and in October the yield of spring wheat was returned at 12·7 bushels per acre, both these figures being, of course, provisional. These estimates would indicate a total production of some 286,000,000 cwt., provided no change be supposed to have occurred since the dates at which the different data were published. This amount is very considerably below that of recent years, and, in fact, many persons in the trade seem to think that the production may be even less. As regards probable exports, no official data naturally exist: but trade forecasts, such as those of the *Corn Trade News*, are current of a probable export from the United States of some 25,000,000 cwt. during the present cereal year, some portion of which will, doubtless, be taken by other countries.

As the United Kingdom now requires well over 100 million cwt. annually, it seems clear that we can look to the United States for only a comparatively small proportion. India had (last March) a very bountiful harvest, and can do much to help the deficiency, but a large part of its surplus has already been shipped, and the same may be said of Argentina. Much, therefore, depends on what these two countries may produce next harvest. So far they promise well; but this remark, in the case of India, can be taken to mean little more than that sowings have been completed under favourable conditions. The Argentine crop is now near maturity, and an export of upwards of 50 million cwt. has been suggested as probable. The harvest in Canada is not thought to be nearly so short as in the United States, so that exports on as large a scale as in recent years may be available. Apart from these two countries, Russia may be expected to supply the larger proportion of our requirements. A recent telegraphic summary states that the Central Statistical Committee at St. Petersburg have estimated the total wheat production of the seventy-two Governments in 1904 at 82,818,000 qrs., or 355,000,000 cwt. This is considerably more than last year, and also much over an average crop. It may be anticipated, therefore, that during the season 1904-5 the bulk of the wheat consumed in the United Kingdom will be of Russian, Argentine, and Indian origin.—*Journal Board of Agriculture, England.*

REPORT ON THE 1904-05 HARVEST AT THE ROSE-WORTHY AGRICULTURAL COLLEGE FARM.

By ARTHUR J. PERKINS.

WEATHER CONDITIONS.

With a view to a better understanding of the results, I am prefacing my report on the 1904-05 harvest at the Roseworthy Agricultural College with a brief review of the weather conditions that presided over the growth of the plants and the development of the grain.

Rainfall.—Below is shown the rainfall for the year, together with the registered means of preceding years:—

	1904. inches.	Mean of preceding 22 years. inches.
January	1·87	0·93
February	0·84	0·48
March	0·39	0·65
April	1·26	2·03
May	1·44	1·82
June	2·43	2·85
July	1·77	1·89
August	1·27	2·17
September	0·36	1·78
October	2·20	1·61
November	0·87	0·91
December	0·00	0·76
<hr/>		
Total	14·70	17·88

On the whole, therefore, the fall during 1904 was fully 3 inches below the registered mean of the preceding 22 years. On the other hand, the distribution, without being ideally perfect, was such as to admit of the production of good average crops.

Late Summer and Early Autumn.—Where cereals are sown on bare fallow, or after fallow crops, weather conditions during the preceding summer and autumn frequently exercise an important influence on the subsequent development of the former. In this connection a moist, temperate summer may always be considered as more or less favourable. It facilitates tillage operations on the fallows, or in the fallow crops, induces the germination of seeds of weeds that would otherwise lie dormant and come up with the crop in the following year; and helps to maintain the surface layers of the soil in that friable, moist condition so favourable to the action of the nitrifying ferment. In all these advantages the crops recently harvested have certainly benefited, for the summer months were both unusually moist and mild.

The Seeding Months.—The seeding months—April and May—were, on the whole, favourable. There is, perhaps, nothing more perplexing to the farmer than late March rains that are not followed up by April

and May rains to ensure successful germination. They leave the soil neither sufficiently dry nor sufficiently moist to render advisable early sowing, and in the meanwhile the time of the year usually most favourable to seeding operations gradually slips away. From this perplexity we were saved last year. March was unusually dry, and an inch and a fifth fell on April 20, affording the best possible conditions for early sowing. Rain in May was somewhat scanty, but well distributed, being represented by half a dozen heavy showers at suitable intervals. Temperature was rather low throughout this month, and it closed with seven successive frosts.

Midwinter Months.—June and July were both wet months. There were eleven wet days in June and eight in July. Both were cold, although over the whole period there was only one frost, towards the end of July. On the whole, although germination was excellent, the low temperature that obtained from the beginning of May to the end of July checked considerably the growth of the crops. This was particularly noticeable in the oat and barley crops, and also in some of the wheat crops. At the beginning of August the general appearance of the crops could hardly be described as healthy.

Spring Months.—August was comparatively dry and cold, nor did the crops make much progress in this month. September was exceptionally dry, and, fortunately, unusually cold, otherwise the crops would have suffered more severely from the prolonged drought. October opened with cool weather and slight showers. On the 19th there was heavy rain, and the rest of the month offered good, warm, growing weather.

Summer Months.—From the 2nd to the 5th of November showery weather prevailed, but from that date to the end of December not a drop of rain fell, offering almost ideal harvesting conditions. November was at times hot, at times cold; whilst December was almost uniformly warm.

Conclusions.—On the whole, therefore, the weather conditions were favourable to the development and ripening of grain, and unfavourable to the growth of heavy crops of straw, and consequently of hay. What at first had the appearances of a late season developed ultimately, under continued dry weather, into a somewhat early one. The quality of the grain—to which I propose referring in detail subsequently—proved quite exceptional, and this, notwithstanding an unexpectedly early appearance of red rust

FIELDS UNDER CROP.

The field under cereals, with their areas, are given below:—

Ebsary's C.—32·36 acres barley.

Ebsary's B.—63·00 acres oats.

Ebsary's A.—51·30 acres wheat.

Nottle's.—209·39 acres wheat.

No. 5.—142·14 acres wheat.

HAY HARVEST.

With the exception of 11 acres that had been cut out for ensilage, the whole of the oats in Ebsary's B were cut for hay. The oats were allowed to ripen well, and were cut somewhat late; the binders started work on October 25. From the 53 acres we gathered in 140 tons, weighed over the weighbridge, and representing a yield of about 2 tons 14 cwt. to the acre.

On November 7 we started cutting wheaten hay in Nottle's; from 40 acres we carted in 98 tons, representing $\frac{1}{2}$ tons 9 cwt. to the acre.

The cats had been dressed with 1 cwt. of superphosphate to the acre, drilled in March, ahead of seeding operations.

The wheat had been similarly dressed, the manure being drilled in with the seed.

Weight of New Hay in the Stack.—As all the hay that was stacked had been previously weighed on a weighbridge, I thought that we had a good opportunity of determining exactly the weight of new hay per unit of volume in the stack. I therefore asked Mr. W. R. Jamieson to cube the stacks as accurately as possible, and to let me have the results.

He found that a stack containing 120 tons of rather ripe oaten hay cubed 1,410 cubic yards, representing $11\frac{3}{4}$ cubic yards to the ton. Hence a cubic yard of this hay, newly stacked, weighed a little over 190 lb.

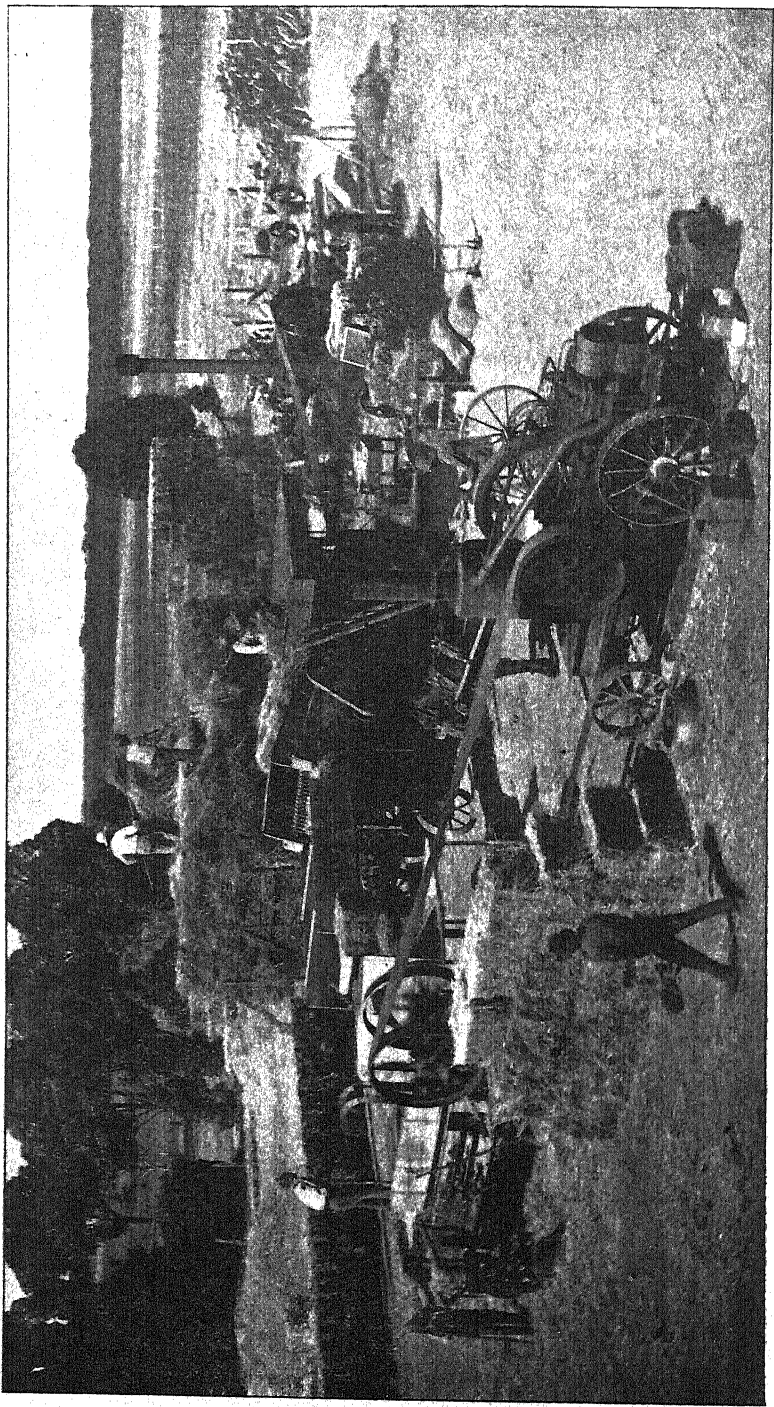
Another stack, containing 96 tons of wheaten hay, cubed 1,116 cubic yards, representing $11\frac{1}{2}$ cubic yards to the ton; and a cubic yard of newly-stacked wheaten hay weighed a little over $192\frac{1}{2}$ lb.

GRAIN HARVEST.

The barley and wheat crops that were reserved for grain were cut with the binders and put through a threshing machine, as has been the practice in the past, at the College. The straw was pressed in a Howard continuous self-feeding press, and an effort was made to save for feeding purposes the chaff and the cavings by heaping them up in a rectangular stack, walled in with bales of straw. The whole process of the threshing operations is illustrated by the accompanying photograph, taken by Mr. R. K. Lawrence.

With nothing but strippers and harvesters around us, it may be questioned whether the practice adopted at the College is, on the whole, the best possible that could be recommended. I think that I am in a position to show that this is certainly the case; and I am not sure but that in the course of time, even with our neighbours, the threshing machine will supersede the stripper and its more modern rival, the complete harvester.

There are many advantages that can be claimed for the thresher. In the first place, should red rust threaten it is always possible, and in fact generally advantageous, to cut the crop in advance of complete maturity of the grain. Perhaps, on the whole, the soft grain, besides es-



caping the baneful effects of rust, is able, in the shelter of the stook, to ripen and develop to better advantage than on the exposed stalk. Further, the crop that is cut escapes many a storm that scatters broadcast the grain that is wearily awaiting the advent of the stripper. Whether under equally favourable conditions the use of the threshing machine leads to the saving of grain is a question that it is difficult to settle off hand. For, however carefully the sheaves be handled, between the field and the threshing machine, there invariably arise unavoidable losses. When the work of the threshing machine is completed by that of the straw press, it leads to the saving of the straw in the most economical manner possible. Nor is it necessary to find a market for this straw to render this operation profitable, for straw has a feeding value of its own that is most generally overlooked in Australia. When live stock are joined more generally to general farming this fact will come to be recognised. Finally, in the cavings and chaff of the thresher we have additional feeding material of considerable value, whenever sufficient trouble is taken to protect them from the weather.

What it costs to handle a harvest in this fashion I shall endeavour to put on record from our own experience, and, be it remembered in this connection, that our labour, though willing enough, is by no means all skilled, and what we can do others can readily better.

I assume that by working continuously, with two shifts, for 16 hours a day, it will be possible to thresh the produce of 30 acres going 20 bushels to the acre. This would mean 130 bags of dressed grain daily. A binder would cut this area in three days, and the cost of the work could be represented as follows:—

Three days' labour, at 6s.	£0 18 0
Twine	2 12 6
Three days' feed for three horses	0 9 0
Wear and tear on binder, etc.	0 3 6

Cost of cutting 30 acres	£4 3 0
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To keep the threshing machine going continuously would be required three hay trollies, with their drivers and horses, and three men in the field, pitching and loading. For two shifts this would mean twelve men for carting and loading, and the expense would be represented as follows:—

Twelve men, at 6s.	£3 12 0
Feed of 12 horses, at 1s.	0 12 0
Interest and wear and tear on trollies	0 2 0

Cost of carting and loading 30 acres	£4 6 0
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To work the thresher and straw press, to stack the wheat and straw, and to handle the cavings and cocky chaff, would be required two shifts of 13 men each, or, rather, one of 12 and the other of 14. They would be distributed as follows:—1 engine-driver, 1 feeder for thresher, 1 cutting bands, 1 bagging wheat and sewing, 1 raking chaff, 1 helping to

throw off sheaves, 1 feeding press, 2 wiring bales, 1 stacking bales, 2 handling cavings and chaff, and 1 shifting bags. The working plant would cost from £580 to £600. I assume that £90 per annum, *i.e.*, 15 per cent., would cover wear and tear and interest. This would represent £3 a day. The cost would, therefore, be distributed as follows:—

Labour at thresher, 26 men, at 6s.	£7	16	0
Fuel and oil	0	15	0
Wire for straw	1	10	0
Interest and depreciation	3	0	0

Cost of threshing 130 bags	£13	1	0
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To sum up, therefore, the cutting, carting, and threshing of 30 acres would be represented by:—

For cutting	£4	3	0
For carting	4	6	0
For threshing and stacking	13	1	0

£21	10	0
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The above estimate, which is in every way an exceedingly liberal one, brings the actual cost to 14s. 4d. an acre, and, in addition to the wheat stacked in bags, we have from $\frac{1}{2}$ to $\frac{3}{4}$ of a ton of baled straw to the acre, besides an abundance of feeding material in the shape of cavings and chaff. I am under the impression that in ordinary circumstances wheat cannot be stripped, cleaned, and stacked for much less than 5s. an acre; the balance, 9s. 4d., is below the value of the straw and chaff.

BARLEY CROPS.

The barley crops were sown in Ebsary's C. The past history of this field is summarised below:—

- 1899. Purchased and fallowed.
- 1900. Under wheat (2 cwt. superphosphate to the acre).
- 1901. Bare fallow.
- 1902. Under wheat (2 cwt. superphosphate to the acre).
- 1903. Bare fallow.
- 1904. Under barley (1 cwt. superphosphate to the acre).

The soil in this paddock is somewhat light, running partly into a sandy pine ridge. It is better adapted to barley and rye than to either wheat or oats.

Four varieties of barley, *viz.*, Cape barley (27·86 acres), Duckbill (2 acres), Chevalier (2 acres), and Skinless barley ($\frac{1}{2}$ acre), were sown from the 20th to the 22nd of April, immediately after 1·20 inches of rain. Germination was satisfactory, but subsequent winter growth slow, and more or less unhealthy. Weeds, too, showed a tendency to smother the crop, so that it became necessary to horsehoe it with an old Garrett hoe. The work done by this implement was quite satisfactory, and ultimately the crop was clean. At harvest time the crop showed well, the plants

being fairly well headed, with a well-developed, plump grain, and short in the straw.

We were deceived in the season. What in the earlier part of the spring had all the appearances of a late season, developed ultimately under continued dry weather into an early one. The barley ripened off rapidly, and the binders could not leave the hay fields to cut it down in time. This *contretemps* resulted in the loss of some grain, particularly in the skinless variety. The binders were set going on the 7th November, immediately after the heavy showers that fell in the early days of that month. Unfortunately, these rains helped to discolour what would otherwise have been an excellent sample of grain. I propose discussing the quality of the grain under a separate heading; there is, therefore, no occasion to dwell upon this question here at any further length. The sheaves were stooked in the field, and threshing started on December 5. The respective yields of the different plots are given below:—

TABLE I.
Yield per Acre of Barley Crops.

Varieties.	Total Produce.	Grain.	Straw and Chaff to 50 lb. of Grain.	Grain to 100 lb. of Straw and Chaff.
	lbs.	bushels	lbs.	lbs.
Cape Barley ...	4,072	38·66	105	47
Chevalier Barley ...	3,165	19·29	164	30
Duckbill Barley ...	3,200	19·12	167	30
Skinless Barley ...	4,000	24·40	164	30

WHEAT CROPS.

The following fields were sown to wheat:—Ebsary's A, Nottle's, and No. 5.

EBSARY'S A.

The history of this field is identical with that already given for Ebsary's C, excepting that in 1904 it again came under wheat.

The manure—107 lb. of superphosphate to the acre—was drilled in ahead of the seed towards the end of March. The seeding extended from April 26 to May 4, shortly after a heavy fall of rain. The condition of the fallow ground was, however, far from satisfactory at seeding time. Part of the ground had been broken up with a Triumph multi-furrow plough, which had done very indifferent work, and throughout the season that portion of the crops growing on this land was in marked contrast with those growing on land broken up with the ordinary three-furrow. The Triumph plough may occasionally find its place in the shallow working of stubbles for catch crops, or, again, in cultivating fallow land, but to break up lea land it is quite unsuited. Had it not been used here the yield of this paddock would have been considerably heavier than ultimately turned out to be the case.

Portion of the seed, viz., Silver King, Comeback, Jonathan, Rerraf, Gluyas, Carmichael's Eclipse, and Petatz Surprise, was purchased seed, and was pickled with a 2½ per cent. solution of bluestone; the balance that was College grown was sown untreated. Ultimately, the whole field proved to be comparatively free from smut or bunt. According to varieties, from 60 to 100 lb. of seed per acre were sown. The College-grown seed was put through a special seed cleaner and grader.

Growth in this paddock was exceedingly unsatisfactory throughout the winter, and in August the plants presented a sickly yellow appearance. I therefore decided to top dress it with ½ cwt. of nitrate of soda to the acre. This was done on August 19. Fortunately, wet weather conditions prevailed from the 27th to the 30th of that month, otherwise in all probability the dressing would have remained ineffective. The plants, however, recovered, and the yield proved ultimately far in excess of what might have been anticipated in spring. The most striking feature, however, was the extraordinary weight per bushel attained by wheats in this field. Whether or not it was attributable to the nitrate top dressing it is difficult at present to say. I shall not, however, dwell at further length on this question, as I propose discussing it in detail at a later date.

Yields and details concerning the various plots are given below, in Table II.:-

TABLE II.

Fields per Acre of Varieties Grown in Ebsary's A.

Varieties.	Area in Crop.	Total Produce per Acre.	Grain per Acre.	Straw and Chaff to 60 lb. of Grain.	Grain to 100 lb. of Straw and Chaff.
	Acres.	lbs.	bushels.	lbs.	lbs.
Silver King ...	2.025	4,091	20.55	199	30
Rerraf ...	1.000	3,300	18.87	175	34
Gluyas ...	20.125	3,354	17.60	191	31
Carmichael's Eclipse ...	4.125	3,207	17.89	179	33
Majestic ...	1.625	4,178	16.72	250	24
Bearded Innominate ...	1.956	3,170	16.21	196	31
King's Early ...	4.556	3,444	15.92	216	28
Comeback ...	2.100	3,048	15.89	192	31
Jonathan ...	2.100	2,376	14.17	168	36
Early Purple Straw ...	2.175	2,690	13.74	196	31
Neumann's Early ...	1.912	2,673	13.50	198	29
Waddy ...	1.944	3,266	12.61	259	23
Boomerang ...	1.787	3,089	12.38	249	24
Californian Purple ...	2.094	2,913	9.86	295	20
Petatz Surprise ...	1.775	2,479	11.39	218	27
Total area ...	51.299	3,137	15.70	200	30

Thus it will be seen that in this field Silver King yielded the heaviest return in grain, and was second only to Majestic for weight of total produce. To us these results came somewhat as a surprise, for Silver King was badly affected with rust, and showed very unevenly in

development of ear. The sample of grain was somewhat poor, pinched grains being fairly abundant. It is quite evident, however, that Silver King is a good yielding variety.

Rerraf, which is second on the list, is new to the College. The straw was short; heads of good average length; occasional plants badly affected by rust.

It should be noted, however, that Gluyas, which comes fourth on the list, was the only variety covering an important area. This excellent variety is deservedly popular with many farmers. For several years I have watched it on the College Farm. At all times it has yielded good average crops, and has never shown a sign of rust, even in very rusty seasons. It has two defects. When overripe it is apt to bend over somewhat at the head, and is always hard to thresh. Its many advantages more than counter-balance these slight disadvantages.

I have but slight experience of Carmichael's Eclipse. I believe that this is the first year that it has been grown at the College. In many respects it resembles Gluyas rather closely. It is somewhat lighter coloured in the straw, however, and does not appear to bend over to the same extent. It proved equally free from rust. On present appearances I am inclined to look upon it as an excellent variety, and well worth a more extended trial.

Majestic, an excellent hay wheat, was, as usual, somewhat blighted off towards the end of the ear, and in consequence perhaps reduced in yield of grain. Bearded Innominate did not come up to expectations; and as for King's Early we are bound to recognise that latterly it has deteriorated at the College. The heads are no longer what they were wont to be. I propose in the future, by systematic selection, endeavouring to improve this variety, that experience has shown to be so well adapted to local conditions.

Of the remaining wheats, Comeback and Jonathan are alone worth mentioning. They are both new to the College, and I am inclined to think that better results may be anticipated from them in the future. I may draw attention to the exceptional weight of Comeback, some of which went 71 lb. to the bushel.

In this paddock Gluyas, Carmichael's Eclipse, Jonathan, and Comeback proved free from rust.

King's Early, Bearded Innominate, Rerraf, Californian Purple, Majestic, Petatz Surprise, and Boomerang were only slightly affected in the stem; whilst Silver King, Waddy, and Neumann's Early suffered more severely, and Early Purple Straw very considerably.

It may be pointed out that on the average in this field there was half a bushel of wheat for every 100 lb. of straw. And in this connection a wheat like Jonathan, with 36 lb. of grain to 100 lb. of straw, is incomparably more profitable at the harvest than a wheat running 20 lb.,

like Californian Purple. I am quite aware that these relations of grain to straw will vary with the seasons, but I am under the impression that in the same field and in the same season they will remain sufficiently constant to set out fairly accurately the relative tendencies of different varieties that are being tested. In a good hay wheat like Majestic the proportion of straw to grain will naturally be higher.

(To be continued.)

HARVESTING THE WHEAT CROP.

THE USE OF THE BINDER AND HEADER.

By W. L. SUMMERS.

Every year there is considerable discussion at the meetings of the Agricultural Bureau as to which method of harvesting the wheat crop is the best. Following a dry year this subject receives special attention from the fact that feed for stock is scarce, and consequently the value of a good stack of straw is brought home with more than usual force. Without wishing to imply that there is any "best" method of harvesting the crop, the purpose of this article is to draw attention to the value and capabilities of the header under conditions prevailing upon an up-to-date farm. Recently, in company with Professor Angus and Mr. R. Marshall, the writer visited the farm of Mr. Albert Marshall, at Wasleys, for the purpose of seeing a Moody patent header at work. Owing to the fact that he has a ready demand for good straw Mr. Marshall cut the whole of his crop with the binder, with the intention of heading it.

On the occasion of our visit the header was being driven by a portable 8 h.p. Hornsby oil engine, and was treating an average of about $3\frac{1}{2}$ tons of sheaves per hour, while the daily output of bagged grain ranged from 280 to 300 bushels. The wheat was Early Solid Straw, a variety very difficult to thresh. The header has an elevator attachment for carrying away the straw, which is stacked as it comes from the machine. The system adopted is to cut and stook the crop, and then head it as it is carted from the field. This greatly reduces the labour attached to the operations, and avoids unnecessary handling of the ripe sheaves, with the consequent loss of grain. It may be objected that should much rain fall there would be considerable damage to the grain in the stooks, but Mr. Marshall states that the stooks are built to shed the water, and that during the unusually wet summer of 1903-4 the damage was, if anything, less than in the standing crops.

At the time of our visit the crop from a 200-acre paddock was being headed. Three wagons were employed in carting, and the sheaves were put through the header as quickly as two men could pitch them on to the receiver from the wagon. As the sheaves were headed they passed on to the elevator, and on to a stack already about 18 ft. in height; four men were kept busy stacking. While all but the heads on the shorter stems

are threshed, the sheaves are left intact and are easily stacked, which is far from being the case with straw from the thresher. Altogether fourteen hands were employed, as detailed below :—

- 3 men carting.
- 2 men in field, helping to load.
- 1 man feeding sheaves through the header.
- 1 boy guiding the sheaves to the elevator.
- 4 men stacking.
- 1 man attending to the cocky chaff.
- 2 men removing and sewing up bags.

The engine consumes about 7 gallons of oil daily, costing 3s. 6d. With labour, this represents a daily outlay of £3 11s. 6d. To attempt a financial comparison of this system of harvesting the grain with that of stripping and winnowing, or of harvesting with the complete harvester, is not the intention of the writer, as it must be recognised that, except on limited areas, or under special conditions, it would be out of the question for the whole of the crop to be cut with the binder and headed. Besides this, the value of the straw is an important consideration, and will vary according to the season, the distance from Adelaide or other large centre, and the use to which it can be put on the farm. Near Adelaide, good straw is, in average seasons, worth within 25 per cent. of the market price of hay, but if any large quantity were placed on the market a serious fall in price would result. In valuing the straw the farmer can, therefore, only place on it what it is worth as food for his stock. For this purpose the straw in the stack would on any farm be worth the cost of cutting the crop, carting, and stacking, which, under conditions prevailing on Mr. Marshall's farm, does not exceed 7s. 6d. per ton. Valuing the straw, therefore, at 7s. 6d. per ton, the cost of harvesting the grain is something under 8d. per bag in a crop averaging about 15 bushels per acre. No allowance is, of course, made for wear and tear, or interest on cost of plant, as it would be impossible to arrive at a fair estimate without knowing how much work is done during the year, and the use to which the oil engine is put during the period when the header is not in work. The price of the Moody patent header, with elevator for the straw, is £80, while the portable oil engine costs £240. A stationary engine costs much less, but as the portable engine permits of the crop being headed at the site most convenient to the farmer it is probably well worth the extra outlay.

The main advantages of harvesting a portion of the crop in this way are:—1. Harvesting operations can be started, say, a week earlier than with the stripper, and thus the risk of loss by storms is greatly lessened. 2. The risk of injury from rust is also lessened. 3. The grain from the headed wheat is, if anything, of better quality than that from the stripper. 4. The farmer has a supply of valuable feed, which will increase the stock-carrying capacity of his farm.

STOMACH AND BOWEL DISORDERS OF THE HORSE.

By VETERINARY SURGEON DESMOND.

*(Continued from page 311, January.)***AFFECTIONS OF THE INTESTINES.**

If the colon is much distended with food or gas it can with ease be felt through the rectum, to be forced back into the pelvic cavity. If the colon is only slightly distended, the natural sounds caused through the movements of the bowels are diminished, but can be heard all over the abdominal cavity; and if the fæces are hard, coarse, and covered with mucus, we have, as a rule, simple impaction of the colon. If we have gas and a metallic sound in the bowels there may be many complications, and one must be careful in giving a diagnosis and prognosis.

Treatment.—In simple cases of impaction of the colon the first step is to give a purging ball, followed by bran mash if the horse will eat them, and a liberal supply of water, with the chill taken off it, to drink. If the purging ball does not relieve the pain in a few hours, it is advisable to give a drench consisting of chloral, 1 oz.; tincture of capsicum, $\frac{1}{2}$ oz.; water, 1 pint.

IMPACTION OF THE RECTUM.

I can give notes of an interesting case of impaction of the rectum—a condition often found in draught stallions that are forced for show purposes, and do not get sufficient exercise. While in practice in Victoria I was summoned by an urgent message to attend a valuable thoroughbred mare, which I found in the following condition:—Pulse, respiration, and temperature normal; prolapse of the rectum, and having the appearance of three knobs, each like two clenched fists.

History.—A week before this mare was found in this condition she was in full training. She was then turned out in a paddock, with long and very dry grass. When visited a week after being turned out it was found that there was no water in the paddock. This may have been the cause of the trouble.

Physical Examination.—Rectum impacted with hard fæces; the lumen of the gut was so much indurated that it was found impossible to insert the nozzle of an ordinary enema syringe.

Treatment.—An emulsion of extract of belladonna and glycerine was passed into the rectum with the aid of a veterinary catheter, and, after using half a gallon of the emulsion about half a barrelful of hard fæces was expelled in twelve hours. A purge of pure linseed oil and chloroform was given. The emulsion was continued for three days, when the rectum resumed its normal condition.

Many owners of draught stallions and stud grooms have a crude but very objectionable method of dealing with impaction of the rectum.

They proceed to remove the hard fæces with the haft of a small file, protected with a cork.

IMPACTION OF THE CÆCUM.

With this affection it is not necessary to go into the matter so fully as in other disorders of the intestinal tract. In the diagnosis and treatment the same lines as those suggested for the colon are advised. When the cæcum is very much distended with ingesta it is possible to find this condition by exploration through the rectum.

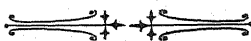
CONCLUSION.

In dealing with gastric and intestinal disorders of the horse the first thing to be aimed at is the location of the trouble—an object which can be accomplished only by a physical examination and a careful consideration of the history. In deciding on a course of treatment the following have to be considered:—Powerful purgatives given by hypodermic methods are not safe in impaction of the stomach. As the horse cannot vomit it is dangerous to cause violent contractions of an overloaded stomach, as the contents cannot escape fast enough into the bowel to prevent rupture. When the pulse is over 60 per minute the case cannot be classed as a simple one. Usually there are inflammatory troubles, such as inflammation of the bowels.

The following drugs are advised, viz.:—

Chloral Hydrate.—This is a valuable drug combined with capsicum in impaction of the different portions of the intestinal tract, and should be given in the following proportions:—Chloral hydrate, 1 oz.; tincture of capsicum (fort), 1 oz.; water, 1 pint.

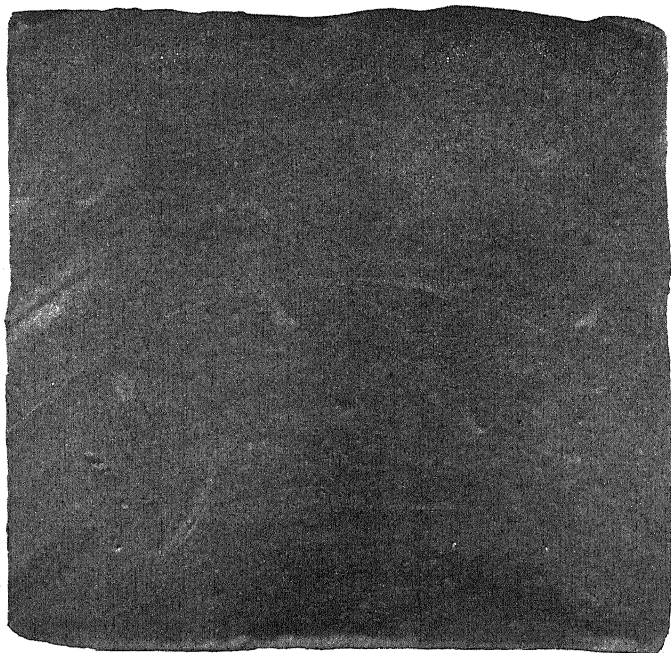
Cannabie Indica (*Indian Hemp*).—This drug, in my opinion, is the most valuable of the sedatives used in veterinary practice. In stomach troubles it is best to use the extract in the form of a ball, giving doses from 1 to 2 drams; while in cæcum and colon troubles it is best given in the form of a drench mixed with mucilage, using doses from 1 to 2 oz. of the tincture. It has the following advantages over opium:—It does not excite the patient and does not lock up the bowels. In full doses it deadens pain and causes sleep, and is not poisonous even with enormous doses.



STREAKY BUTTER: ITS CAUSE AND REMEDY.

By P. H. SUTER, Dairy Expert.

Streakiness and carelessness in packing are two of the weakest points I have noticed in butters inspected by me in this State. The latter I will deal with in the next issue of this journal. Streakiness shows carelessness or incompetency on the part of the maker. The butter presents a very unsightly appearance, resulting in a reduced price of from 2s. to 6s. per cwt., or as many pounds per ton. There is no excuse for this defect. The following photograph shows the streaky appearance of a 56-lb. lump of butter when cut in halves:--



This trouble is experienced by all managers at some time. Particularly is this so where managers adopt a system of working the butter but once, and where creams are churned and butters are washed at varying temperatures. This results in different percentages of water existing in butters and in different degrees of firmness. Where coarse-grained salt is used streakiness will often be found, due to the fact that the time given in working the butter has not been sufficient for the salt to absorb enough moisture to bring about its own solution. Thus, it remains insufficiently incorporated, intensifying the colour of the butter immediately surrounding it, and producing a light, patchy, streaky appearance in the mass.

I would point out the great importance of storing salt intended for butter or cheese in a scrupulously clean, dry place, free from any ill odours, oils, or impure atmosphere, for salt is a powerful absorbent, and organisms have been known to grow in it vigorously. I have seen salt stacked near strong-smelling oils, and oftentimes thrown down carelessly in any out-of-the-way corner in the factory, and covered with dust. Very often the bad flavours of butter may be traced to the salt used in dairies where such carelessness exists. Butter-makers should remember that even the very best salt is none too good for such a delicate product as butter. Cheap salt has often been found to contain impurities, and where used results in a lower price being secured. The use of inferior salt very seriously affects the keeping quality and flavour of butter; indeed, in my opinion, a much larger proportion of the poorer Australian butter is directly traceable to this cause than is generally supposed. On the other hand, good quality salt improves the keeping quality, gives flavour, and brings out the colour, making the butter of a clearer and brighter appearance.

I have noticed particularly that when water at too low a temperature is used for washing the butter in the churn there is a marked tendency to streakiness and to dissipate the flavour. These effects are due to the cold water coming into contact with butter granules of a higher temperature. The outer surface of the granules is rendered firm, whilst the inner portion remains in a soft condition, the result being butter uneven in condition and temperature. When this is placed on the butter-worker for working the salt works more readily into the soft butter at the high temperature than into the cold and firm portion, giving an unevenly salted product. The same effects are noticeable, but to a less extent, when a fine rose or sprinkler is used for washing the butter down as it revolves on the worker. Such sprinkling is unnecessary if the butter has been properly churned, as nearly all of the buttermilk will have been removed in the washing of the butter in the churn. If butter containing an undue proportion of buttermilk be made up, it will be found to possess poor keeping qualities, for the buttermilk furnishes food for the organisms which bring about decomposition, accompanied by poorer flavours. This milkiness is often caused by churning at too high a temperature, or by insufficient washing or by over-churning. Butter produced at too high a temperature is soft and greasy. In such a condition it is impossible to effect anything like a practically complete removal of the buttermilk or caseine. Moreover, churning at too high a temperature results in an undue loss of butter fat in the buttermilk when drained off, whilst the colour of the butter suffers, it being lighter than that of butter churned at the proper temperature, viz., 52° to 54° Fahr. At this temperature the butter at the "break condition," or granular stage, will be found nice and firm, with the moisture evenly distributed, thus offering facilities for the uniform dissolving of the salt of the butter when worked. The object of adding the breakwater, *i.e.*,

when cream just breaks into small granules of butter, is twofold. It has the effect of causing the buttermilk to come away more readily from around each granule, and it slightly consolidates the granules, preventing them from being rubbed too easily together and becoming greasy, and so has a good effect on the texture.

Among other causes tending to produce streakiness in butter may be mentioned:—1. Overloading the butter-workers. 2. The heating of the exposed surface of butter in butter-working rooms after coming from the churn, due to the workroom being at too high a temperature. The former cause is easily prevented. Many managers have to contend hopelessly against the latter, owing to their working-rooms allowing no regulation of temperature. In almost every factory I have visited in this State I have found the butter-working room showing temperatures ranging as high as 90° Fahr., yet in the same factories more or less effective provision is made for cooling the cream and churning it under suitable conditions of temperature. A manager can hardly be expected to produce a product of uniform quality if compelled to work up his butters in a room from 20° to 30° hotter than it should be. It is important that butter-working rooms should be suitably insulated, to prevent temperatures rising too high.

Having enumerated the principal causes of streakiness in butter, I shall now explain how to prevent them:—

1. I must strongly recommend makers to be careful as to the temperature of their washing water for butter when in the churn. They should never use water much below the churning temperature of their cream, unless sufficient time is given to allow the butter to be brought to an even temperature. If they churn at 50° to 54° Fahr., then they should wash with water at from 48° to 54° Fahr. No hard-and-fast rule can be laid down as to churning temperature, but, as a rule, 50° to 54° Fahr. in summer will, in South Australia, secure a nice, firm, good-conditioned butter for working. Should makers deviate from this to any great extent, and churn, say, at 50°, and wash with water at from 38° to 45° Fahr., then they are almost certain to be troubled with that very undesirable fault of streakiness.

2. In order to reduce the chances of streakiness to a minimum, I strongly advise all butter-makers to work all their butter twice. The advantage of this, especially in the case of butter for oversea markets, is that we secure a drier, better-conditioned butter, of good keeping quality, and at the same time obviate any chance of streakiness. The two workings should be done as follows:—The butter, on coming from the churn, should be worked just sufficiently to expel any surplus moisture, one or two rounds of the worker being generally adequate. Then, adding salt at the rate of 3½ to 4 per cent., and preservative at the rate of ¼ to ½ per cent., see that this mixture is evenly distributed through a fine sieve, and is worked sufficiently to ensure a thorough incorporation

of the salt, just on the verge of the streaky stage: this completes the first working. The butter should then be removed to a room kept at a temperature of from 52° to 58° Fahr. If the temperature falls too low, the butter becomes too firm to pass comfortably under the rollers during the re-working, and this interferes with the texture. After remaining in this room for from six to twelve hours the butter is ready for the second working, which usually consists of from two to four rounds of the worker, according to condition. A good plan for a butter-maker to follow is to work his butter for a certain time and remove a sample at different intervals, say, one after two minutes' run, and others at the end of three, four, five, six minutes, placing the samples aside for 12 to 24 hours in a cool room to firm. These samples should be examined the following morning in order to find which time gave the most complete and best working in of the salt. Suppose that three minutes showed signs of streakiness, but four minutes showed thorough working free of streakiness, then he might conclude that three minutes is too short, and four minutes is ample, whilst any further working is only lost labour, and interferes with texture. It is, of course, understood that the conditions under which the samples are obtained are fairly uniform as regards churning, speed of worker, amount of salt, temperature, moisture, etc.

POULTRY NOTES.

By D. F. LAURIE.

SEASONABLE NOTES.

The recent spell of hot weather has, unfortunately, resulted in heavy mortality among poultry of all sorts. In a climate such as ours, where we often experience excessive heat, followed by severe changes, the need of shelter for the birds is very urgent. Live shelter, such as is afforded by trees and shrubs, is the best, and I find that where such is available the birds rarely take cold as a result of a violent change. I find the so-called tree lucerne or tagosaste (*Oytisus proliferus*) grows rapidly, and makes excellent hedges and shelters. Seed can be sown where it is to remain, or may be transplanted during the early rains from a seedbed. The real tree lucerne (*Medicago arborea*) only grows about six feet high, and is good green food, but not of much value for shelter in summer. The carob (*Ceratonia siliqua*) makes splendid shelter and hedges, and grows easily from seed, but transplants badly. Now is the time to prepare the ground so as to have it ready for early sowing. Where water is obtainable small patches of rape should be sown. There is no better or more relished green food than well-grown rape, and a supply throughout the year should be assured.

Pay scrupulous attention to the drinking water. It is not enough to replenish the vessels; they should also be cleansed at time of filling, and should be scalded frequently. Dirty vessels may in our climate be-

come veritable plague spots. Keep cool and shaded; sun-heated water develops organisms, especially the streptococcus, which causes so many great losses yearly, and which is sometimes confounded with chicken cholera.

Keep your birds free of vermin. No stock thrive if infested, and it is merely a matter of regular attention and prompt action. The provision of dust baths for the birds should not be forgotten. By regular dusting they rid themselves of these pests, which speedily perish in fine dust. All houses should be of iron, and the perches of planed hardwood, which should occasionally be disinfected with kerosine, with a little oil added. All nests should be frequently renewed, and slaked lime and ashes freely used. If ticks appear, lose no time in exterminating them. For application to the birds use oil three parts, kerosine one part. Apply with a piece of rag or sponge. For the houses, use strong kerosine wash, one part kerosine, eight parts soapsuds, with a little oil (whale, fish, or machine) added. If applied with a syringe or spray pump, see that all crevices are flooded. Never rest until the pest is exterminated, which is an easy matter if the houses are of reasonable construction.

Old and unsatisfactory stock should be disposed of without delay, otherwise such will soon be in full moult, and practically unsaleable. Where the stock hitherto kept consists of unproductive mongrels, an effort should be made to clear them out, and replace with profitable utility birds, which can now be obtained at reasonable rates. Cull the young stock carefully and dispose of wasters and poor specimens so as to provide more room for the growth of the more valuable birds.

Because your hens may shortly cease laying, do not neglect them. The process of moulting is a severe strain on the system, and as at this season we are often subjected to considerable variations of temperature, the half-clothed birds may suffer greatly. Feed carefully, but not too heavily. The use of Douglas mixture is advisable, as, in addition to its action as a tonic, it also promotes feather growth. Do not add this mixture to water contained in a metal receptacle, or trouble may result. Use earthenware vessels. Excellent results have been had from the addition of this mixture to the soft food three times a week. Add two tablespoonfuls to each quart of warm water used for mixing with the soft food, mash, etc.

CANNED EGGS.

It is reported that a trial shipment of canned eggs has been forwarded from Queensland, to test the English market. For many years a large trade in canned yolks and whites has been carried on by the Russians. London is the chief market. From information published in Victoria the prospects of a profitable trade in canned eggs are very satisfactory.

EGGS FOR MARKET.

Exposure to the hot sun causes much loss in eggs. The nests should be in as cool a spot as is obtainable; the eggs should be collected several

times during the day, and stored in a cool cellar. Over-heated eggs soon become unsaleable, but a little care may prevent much loss.

ENGLAND'S POULTRY AND EGG BILL.

Over six million pounds sterling is paid yearly by the English consumer for foreign eggs. Most of this money goes to Russia, Austria, Germany, and France. Of late a fair number of eggs have been sent from both Canada and the United States. Considering our unrivalled climate and abundance of cheap food, and the fact that our geographical position enables us to land our produce when competition is least, and prices at their highest, it is time that active steps were taken to promote an oversea trade, so that Australia may claim a considerable share of the vast amount referred to.

TABLE POULTRY.

The poultry salesmen reported that the Adelaide market was glutted with very inferior birds at Christmas. Despite the advance in the quality of our poultry, there are still many thousands in the State of a most miserable appearance, and certainly most unprofitable. It costs less to feed a good bird, and the profits are very much greater; that is, granting that mongrels may give a small return. It is not expected that our farmers should keep show birds, but they would be wise to obtain good specimens of the best utility breeds. The Dorking is, of the large breeds, the best for the English market. For quality, though of less bulk, the Old English Game heads the list. The result of a cross between the two is the acme of perfection. Splendid crossbreds result from either Indian or Old English Games crossed with Dorking, Wyandotte, Orpington, and Langshan hens. Crossbreds such as these grow rapidly, fatten easily, and are large, marketable birds at a time when the mongrel is a shapeless mass of legs, wings, and general attenuation.

COUNCIL OF AGRICULTURE.

The annual meeting of the Council of Agriculture was held on Wednesday, January 11, 1905, there being present:—Col. Rowell, C.B. (Chairman), Messrs. A. Molineux, J. W. Sandford, A. M. Dawkins, John Miller, John Hill, R. Marshall, and W. L. Summers (Secretary).

Veterinary-Surgeon Desmond attended by direction of the Hon. Minister in connection with enquiry into losses of cattle caused by the disease known as dry bible, impaction, paralysis, etc. Mr. Miller stated that for years these losses had been going on, and they had averaged probably over 1,000 head per annum. The stockowners of South Australia wanted to know the cause of the losses and how to prevent them in future. Losses occurred at all seasons of the year and under all conditions. Mr. Marshall said he could bear out this, as he had suffered severe losses at different times. His cattle were always well fed. When they were not getting sorghum or ensilage they received bran and chaff, yet losses occurred

at intervals. Mr. Desmond said he believed Mr. Miller was well within the mark when he said the losses averaged over 1,000 head of cattle annually. The disease should be enquired into by a veterinary. Dry bible and paralysis were only symptoms, and not the causes, of the trouble, and until they found out what was the cause they could not indicate what preventive action should be taken. He had carefully studied the replies to questions submitted to the members of the Bureau some time since, but they did not help at all in arriving at the cause. Enquiry and investigation in affected herds, with research work in the laboratory, were essential. On the motion of Mr. Molineux it was resolved that, in view of the immense losses sustained of late years, the Hon. Minister be urged to consider the immediate necessity for deputing a competent individual to enquire into the cause of the disease generally known as dry bible or impaction.

The Secretary for Agriculture forwarded letter from Victorian Department of Agriculture intimating that, in view of the precautions taken in that State in respect to quarantine restrictions in districts infested by tick—restrictions considered absolutely necessary by their officers—the Minister of Agriculture for Victoria could not see his way to modify the regulations dealing with the importation of poultry. The Secretary for Agriculture, in forwarding the reply for the information of the Council, stated the Minister was of opinion that no further steps could be taken to secure a modification of the Victorian restrictions on the importation of South Australian poultry. He was, however, of opinion that something should be undertaken in this State to deal with what was undoubtedly a serious pest to poultry-keepers, and was arranging a conference with a view to drawing up a definite scheme of operations.

The Secretary for Agriculture forwarded copy of prospectus of Roseworthy Agricultural College, showing that the syllabus of the scholarship examinations had been modified somewhat, on the lines suggested by the Council, in order to give country competitors a better opportunity. The 1905 examinations would, however, have to be held under the old examinations, as sufficient notice had not been given of the alterations.

On the motion of Mr. Sandford, the following gentlemen were approved as members of the undermentioned Branches:—Messrs. G. Reidel, Morgan; R. Hunt, Morphett Vale; S. H. Curnow, Cherry Gardens; James Nankivell and C. Parsons, Minlaton; R. Richardson, Koppio; A. Bothwell and J. Kingham, Davenport.

Mr. Molineux thought the Council should be pleased to see that the Railways Commissioner had issued special instructions to railway employees, insisting on fruit and other produce being carefully handled.

Mr. Miller reported having attended the meeting of the Corn Trade Committee of the Chamber of Commerce on December 21, with Mr. R. Marshall, as representatives of the Agricultural Bureau. The standard weight of the f.a.q. sample agreed on was 63 lb., which was under, rather

than over, the bulk as made up from the samples sent in and used. Every desire was manifested by the committee to get a fair result as far as possible. He was, however, of opinion that the system was imperfect, for the following reasons:—1. The samples were not representative of the whole State. 2. Nor of equal weight or measurement in themselves. The raising of the standard from $61\frac{1}{2}$ lb. to 63 lb. will injuriously affect all the stored wheat held over from last year, although in many, if not most cases, the wheat would weigh 63 lb., but no system obtains of giving the weight of the samples on the holders' notes, and farmers hitherto have been satisfied to hold the f.a.q. certificate, and the almost inevitable result will be that reductions of $1\frac{1}{2}$ d. per bushel will be made on this stored wheat. To encourage the production of first-class grain they should have fixed standards, and at least two classes or grades, and a better system by which to ascertain the actual weight of samples of wheat. For these and other reasons he moved an amendment, that the standard should be 62 lb. Mr. R. Marshall said he had always contended that the standard should be fixed as high as possible, consistent with the average of the yield for the season, so that the farmers would get the benefit from the high quality of their wheat.

On behalf of the Agricultural Bureau and members of the Council, and in recognition of his work in the improvement of wheats, Col. Rowell presented Mr. R. Marshall with an enlarged photograph, nearly lifesize. Mr. Marshall said he highly appreciated the gift, and wished to thank the members of the Bureau for their kind recognition of his services.

SOME NOTES ON TASMANIAN WOOL SALES.

By GEORGE JEFFREY.

On December 29 I left Adelaide for Tasmania to attend two wool sales, one held in Launceston and the other at Hobart, and it has occurred to me that it might be of interest to some of the readers were I to put on paper some of my observations while in the island State.

In the first place, I went over with between thirty and forty wool-buyers, and, as I was not in my official capacity, I was fairly free to do as I liked. The reason why so many woolbuyers went over at the one time was due to the fact that the Melbourne and Sydney markets were closed for a fortnight, and, as the bulk of the buyers referred to have come a long way they naturally want to put in all the time they can buying. It is not my business to advocate selling wool in the States *versus* sending it to England, but I will say, for the satisfaction of those who sell their wool in Australia, that I am convinced that there is sufficient competition to secure the highest market values at the local sales. In fact, wherever there is a sufficient quantity of wool sold there is little doubt that plenty of buyers will come along to ensure reasonable com-

petition. This, I am sure, applied to the wool sales I am referring to, where, by the way, they are fighting the battle we have fought in South Australia, and that has been fought and won throughout the States generally, viz., the battle of having a permanent market at their own door. Naturally the wool-broking firms of Sydney and Melbourne, who until recently sold the bulk of the wool grown in Tasmania, have been doing all that they legitimately can do to block the establishment of sales over the water, but their efforts have failed, and there is no doubt that the Tasmanian wool sales have come to stay. The Tasmanian wool-brokers have made remarkable strides as regards showing the wool for sale, but they have nothing to teach our South Australian firms. Indeed, I have not seen wool in any of the Australian sales better shown than it is in Adelaide. As to the get-up of clips by the farmer, I cannot be so complimentary, for the majority of the lots offered were very badly put together. No doubt, as the farmers get more educated in this respect, an improvement will be noticed, and an increase in prices will be the result. Despite the fact that much of the wool was badly got up, it sold remarkably well, especially coarse crossbreds and Lincolns, which are now two or three times as dear as they were three years ago. Doubtless, the large prices referred to are accounted for by the Russo-Japanese war—the Japanese being large purchasers of woollen clothing for their soldiers. In Bradford alone, I understand, the orders for cloth for this purpose amount to one and a half millions sterling, and I heard of one firm who got an order for 800,000 pairs of blankets. I was much struck with the sagacity and business ability of the Japanese in ordering their cloth. It is generally known that all cloth is made of a certain width—28 inches, or double width 56 inches. The Japanese, being small men, have concluded that a less width would do for making their suits, and have contracted for a cloth so many inches narrower, thus cheapening the price of the material. They also insist that the cloth shall be made of a given kind of wool, and are so technically informed that they stipulate not only what kind of wool the cloth shall be made of, but the counts to which the yarn shall be spun.

But I have departed from my subject a little, and must get back. It is very well known that Tasmanian wool is, generally speaking, of a very high quality, and what I saw justified the good opinions held of the wool from the little island. However, I would be very sorry to see our South Australians alter much from the track they are on with respect to their wool. Generally speaking, our Merino wool is of that bold, robust type which has been proved to be so profitable to the grower, and, as the Merino sheep must be the dominating type in wool production in this State, it is most important to be on profitable lines. Admitting that the Shropshire, Dorset-Horn, Lincoln, and other breeds have a very important place, the fact remains that the bulk of our farmers must use the Merino ewe to cross with these other breeds, and if they stick to the type we have here I feel certain that from a monetary standpoint

they will compare very favourably with anything I saw. I noticed that the Shropshire wool was particularly good—in fact, better than ours; but instead of this being an advantage, I look upon it as the reverse. You cannot produce the maximum of wool and mutton on the same frame, and as a Shropshire is essentially a mutton sheep, I firmly believe that it should be kept as such. So strongly do I feel on this matter, that were it in my power I would withdraw the prize given by the Agricultural Society for Shropshire wool, as it only tempts breeders of this most excellent sheep to make more of wool than they ought to do. My experience decidedly leads me to say that wherever breeders have attempted to make the Shropshire a wool-growing sheep the carcase has suffered.

At the two sales referred to something like 17,000 bales were disposed of, and even this quantity did not satisfy the large number of buyers who went there. Some buyers scarcely got any wool at all. It is difficult to say what is going to happen in the near future *re* prices. Judging, however, from the talks I had with members of different sections of buyers, the general inclination seems to be that, as stocks in the manufacturing centres are lower than they have been for very many years, and with the prospects of a long war between Japan and Russia there is little reason for wool to fall for some time to come, more especially if the Americans can hold the wool they have bought. Taking everything into consideration, I would not be at all surprised to see wool open in Australia next year on as high, if not higher, a basis than ruled during the season just ended.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on February 1, 1905:—

It is conceded that January is one of our hottest months, and in its earlier days a heat wave set in, which was very widespread, extending right across the continent, and of much more severity than has been experienced for a number of years. Therefore, with feed in such abundance, it was not surprising that bush fires were frequent and large tracts of country damaged. However, towards the end of the month thundery conditions prevailed in this State, and reports are just to hand of a very general and useful rainfall, so that, after all, January records rains above the average. Meantime, farmers were enabled to successfully complete harvesting operations, and in the standard of their grain and hay gathered there is little, if anything, to be desired on the score of quality. The pastoral interests are not by any means languishing, the market for wool continuing strong, as also lambs have been in excellent demand for export.

COMMERCE.—The lull in business that is usual immediately following Christmas and New Year holidays was of short duration, no doubt the result of the successful harvest, and the general opinion is that South Australia has every prospect of experiencing a year of prosperity. Merchants are finding a continuance of buying orders freely coming along, and, indeed, a healthy commercial tone prevails throughout. There is also a firming in Copper, Silver, and Lead, and Broken Hill shareholders are well content with the steady but substantial improvement in the month's returns from the mines.

BREADSTUFFS.—Early in the month the value of U.K. cargoes somewhat receded, but the political unrest in Russia has caused rates to firm again, and

33/- is now quoted for cargoes for prompt shipment. At the moment of writing, however, the market is reported dull. In the Commonwealth the price of Wheat has remained fairly steady. In New South Wales the sample is very irregular, and for the better qualities high prices are being paid, millers particularly being anxious to secure a stock of good wheat. A large shipping business has been done in Victoria at from 3/4 to 3/4½ f.o.b. Here the market eased slightly at the beginning of the month, but is now again firmer. FLOUR.—We have not heard of any large transactions. Some shipments have been made at about £8 per ton f.o.b. for South Africa, but the London market has been exceedingly dull, and little business carried through. FODDER.—For prime green chaff, buying orders for Sydney were placed on this market, but towards the end exporters were not operating just as freely. However, local trade has kept stocks from accumulating. Offal had strong demand. Bran found buyers outside the State at 9½d. f.o.b., and the South Australian sale for Pollard has kept millers' stocks absolutely nil. FEEDING GRAINS.—Under the influence of western and local orders Oats have firmed. In Barley, maltsters are busily operating.

POTATOES—Adelaide supplies are mostly now obtainable from the hills close to the city, but owing to the heat the crops are lighter than usual. New season's "Gambiers" are now coming along and meeting with sale, especially for country orders. Throughout January values fluctuated, but are now steadier. Onions had strong export enquiry, but at this season of the year there are only occasional lots hardy enough for export purposes, and as the yield is light values have rapidly advanced.

DAIRY PRODUCE.—The immediate effect of the heat wave was to lessen supplies of Butter, also to injure quantities of most lines then arriving: result, buyers experienced considerable difficulty in securing anything like their wants of top grades, and for these a sharp advance was obtained. It was, however, predicted that rates would recede once cooler weather set in, and although there was a decided increase in the lots forwarded, under the influence of continued strong demand, prices have not come back anything to the extent expected. In lower grades of Butter it was scarcely reckoned that pastry or heated sorts would participate in the rise, but bakers kept the rooms well cleared at about a shade over former quotations. Eggs met with excellent clearance, and although no abrupt advance took place, values steadily hardened, owing to eastern and western orders, which, towards the last week, caused the market to be almost bare. CHEESE.—The consumption in this line has been considerably stimulated of late, and stocks of recognised brands found speedy clearance. BACON.—There has been an absence of oversea orders, and as local business has only been of a limited character, price of factory sides is depressed. Hams have had a fair amount of attention, supplies of prime and assorted weights still being short of requirements. Honey had better sale, but only for city wants, and no improvement need be expected until export buyers commence operations. ALMONDS.—As it is between seasons, there is practically little or nothing doing.

In Live Poultry there is again, unfortunately an overdue proportion of medium and poor sorts being forwarded, which naturally brings selling rates down; therefore, we strongly recommend only birds well fitted for table purposes to be marketed, and for such invariably the prices secured are highly satisfactory.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/4½ to 3/5 per bushel of 60 lb.

FLOUR.—City brands, £8/5/- to £8/10/-; country, £7/10/- to £7/15/-.

BRAN.—9½d.; POLLARD, 1/- per bushel, of 20 lb.

OATS.—Local Algerian and dun, 1/7 to 1/9; white champions, 1/11 to 2/1, prime.

BARLEY.—Cape (feeding), 1/10 to 2/- per bushel; malting sorts, 3/6 to 4/-.

CHAFF.—£2 to £3/2/6 per ton of 2,240 lb., f.o.b. Port Adelaide, for prime green new.

POTATOES.—New locals, £6/5/- to £6/10/-; Gambiers, £6/5/- to £6/10/- per ton of 2,240 lb.

ONIONS.—New locals, £11/10/- to £12/10/- for prime, per ton of 2,240 lb.

BUTTER.—Factory and creamery fresh, in prints, 11d. to 1/1: choice separators and best dairies, 10d. to 11d.; fair dairies to ordinary separators, 8d. to 9d.; well-graded stores, 7d. to 7½d.; heated and stale lots, 6d. to 6½d.

CHEESE.—Prime new make, 4½d. to 6d.

BACON.—Factory-cured sides, 5½d. to 6d.; farm flitches, 4d. to 5d. per lb.

HAMS.—S.A. factory, 8d. to 9d. per lb.

EGGS.—Loose, 8½d.

LARD.—In bladders, 4½d.; tins, 4d. per lb.

HONEY.—1½d. to 2d. for prime clear extracted new season's, in 60-lb. tins; beeswax, 1/1½ per lb.

ALMONDS.—Softshells, 3½d.; kernels, 7½d. per lb.

LIVE POULTRY.—Heavy-weight table roosters, 1/10 to 2/4 each; good conditioned hens and fair cockerels, 1/2 to 1/8; poor and weedy, 8d. to 11d.; ducks, from 1/- to 2/, according to quality; geese, 2/6 to 3/3; pigeons, 5d.; turkeys, 6d. to 8d. per lb. live weight for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

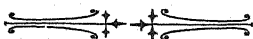
With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.			Date of Meeting.			BRANCH.			Date of Meeting.		
Ardrossan	..	Feb. 15	Mar. 15			Morphett Vale	..	Feb. 21	Mar. —		
Balaklava	..	11	11			Mount Gambier	..	11	—		
Booleroo Centre	..	14	21			Mount Pleasant	..	—	3		
Bowhill	..	4	4			Mount Remarkable	..	16	21		
Brinkworth	..	3	3			Nantawarra	..	15	15		
Burra	..	17	18			Naracoorte	..	11	11		
Cherry Gardens	..	14	14			Narridy	..	25	—		
Clare	..	17	17			Norton's Summit	..	17	17		
Colton	..	4	4			Onetree Hill	..	16	16		
Crystal Brook	..	11	—			Penola	..	11	11		
Eudunda	..	20	20			Petina ..	..	25	—		
Finniss	..	6	6			Pine Forest	..	14	21		
Forest Range	..	16	16			Port Broughton	..	18	18		
Golden Grove	..	16	16			Port Elliot	..	18	18		
Inkerman	..	14	21			Port Lincoln	..	18	18		
Johnsburg	..	8	8			Richman's Creek	..	—	20		
Kanmantoo	..	4	17			Riverton	..	18	18		
Kapunda	..	4	4			Saddleworth	..	17	17		
Kingscote	..	13	13			Stansbury	..	—	4		
Kingston	..	25	25			Strathalbyn	..	20	20		
Koolunga	..	16	16			Utera Plains	..	18	18		
Maitland	..	4	4			Virginia	..	20	20		
Mallala	..	6	6			Wandearah	..	20	20		
Mannum	..	18	18			Whyte-Yarcowie	..	18	18		
Meningie	..	11	11			Willunga	..	4	4		
Millicent	..	2	2			Wilmington	..	15	15		
Minlaton	..	11	11			Wilson	..	18	—		
Morchard	..	18	18			Woolundunga	..	11	11		
Morgan	..	18	18								

MONTHLY RAINFALL.

The following table shows the rainfall for the month of January, 1905:—

Adelaide ...	1.51	Manoora ...	1.70	Echunga ...	1.39
Hawker ...	1.91	Hoyleton ...	1.92	Macclesfield ...	1.55
Cradock ...	2.16	Balaklava ...	2.36	Meadows ...	0.98
Wilson ...	2.00	Port Wakefield ...	1.78	Strathalbyn ...	1.19
Gordon ...	1.20	Saddleworth ...	1.44	Callington ...	1.56
Quorn ...	1.20	Marrabel ...	1.65	Langhorne's Bridge	1.36
Port Augusta ...	0.53	Riverton ...	1.80	Milang ...	1.09
Port Germein ...	1.16	Tarlee ...	1.25	Wallaroo ...	1.39
Port Pirie ...	1.42	Stockport ...	2.02	Kadina ...	1.28
Crystal Brook ...	1.12	Hamley Bridge ...	1.93	Moonta ...	1.41
Port Broughton ...	1.83	Kapunda ...	1.53	Green's Plains ...	1.40
Bute ...	1.64	Freeling ...	1.67	Maitland ...	1.23
Hammond ...	1.26	Stockwell ...	1.71	Ardrossan ...	1.56
Bruce ...	0.94	Nuriootpa ...	1.24	Port Victoria ...	0.62
Wilmington ...	1.33	Angaston ...	1.17	Curramulka ...	0.97
Melrose ...	1.72	Tanunda ...	1.57	Minlaton ...	0.60
Booleroo Centre ...	1.28	Lyndoch ...	1.93	Stansbury ...	0.66
Wirrabara ...	1.13	Mallala ...	1.65	Warooka ...	0.90
Appila ...	1.00	Roseworthy ...	1.87	Yorke town ...	0.84
Laura ...	1.06	Gawler ...	1.77	Edithburg ...	0.79
Caltowie ...	1.44	Smithfield ...	1.46	Fowler's Bay ...	0.66
Jamestown ...	1.24	Two Wells ...	1.55	Streaky Bay ...	0.44
Gladstone ...	1.53	Virginia ...	1.47	Port Elliston ...	0.62
Georgetown ...	0.53	Salisbury ...	1.20	Port Lincoln ...	1.04
Narridy ...	0.54	Tea Tree Gully ...	1.41	Cowell ...	1.02
Redhill ...	1.06	Magill ...	1.22	Queenscliffe ...	0.70
Koolunga ...	1.00	Mitcham ...	1.22	Port Elliot ...	1.20
Carrieton ...	1.17	Crafrers ...	1.62	Goolwa ...	1.22
Eurelia ...	1.16	Clarendon ...	1.19	Meningie ...	1.10
Johnsburg ...	1.05	Morphett Vale ...	0.94	Kingston ...	0.82
Orroroo ...	1.43	Noarlunga ...	0.77	Robe ...	0.37
Black Rock ...	1.68	Willunga ...	1.06	Beachport ...	0.57
Petersburg ...	1.28	Aldinga ...	0.87	Coonalpyn ...	1.14
Yongala ...	1.37	Normanville ...	1.01	Bordertown ...	1.19
Terowie ...	1.57	Yankalilla ...	1.21	Wolseley ...	1.01
Yarcowie ...	2.13	Eudunda ...	1.15	Frances ...	1.11
Hallett ...	1.34	Truro ...	1.43	Naracoorte ...	0.68
Mt. Bryan ...	0.75	Palmer ...	1.72	Lucindale ...	0.53
Burra ...	0.98	Mount Pleasant ...	2.30	Penola ...	0.52
Snowtown ...	2.05	Blumberg ...	1.92	Millicent ...	0.51
Brinkworth ...	1.09	Gumeracha ...	2.06	Mount Gambier ...	0.76
Blyth ...	1.82	Lobethal ...	1.68	Wellington ...	1.17
Clare ...	1.16	Woodside ...	1.68	Murray Bridge ...	1.45
Mintaro Central ...	1.56	Hahndorf ...	1.52	Morgan ...	1.41
Watervale ...	2.29	Nairne ...	1.78	Overland Corner ...	1.65
Auburn ...	1.76	Mount Barker ...	1.56	Renmark ...	1.16



AGRICULTURAL BUREAU REPORTS.

Longwood, November 26.

PRESENT—Messrs. Antuar (chair), Nicholls, Russell, and Hughes (Hon. Sec.), and three visitors.

DESTROYING WEEDS.—A member stated that he found a part of sulphuric acid to eight parts of water a good scrub exterminator.

CHERRY NOT FRUITING.—Mr. Russell stated that he had several cherry trees which flowered freely each year, but failed to set fruit. Members thought this due to unsuitable stock, or to the fact that the trees were of a variety that required the pollen of another variety to fertilise it.

Willunga, December 10.

PRESENT—Messrs. Binney (chair), Manning, Allen, Pengilly, and Hughes. (Hon. Sec.).

HARVESTING PEAS.—At previous meeting considerable discussion on this subject took place. For small areas cutting with the scythe was generally practised, and for large crops, gathering with a horserake, without cutting, or after cutting with a grasscutter. These methods gave fair results, but it was agreed that the new pea harvester did excellent work, leaving the field as clean as hay stubble, and securing practically all the peas.

PIGS.—Members were generally of opinion that for bacon the purebred Berkshire and for porkers the Essex-Berkshire cross gave best results.

BEEKEEPING.—Mr. Manning read a short paper on this subject, dealing with the matter from the standpoint of the beginner, whom he strongly recommended to study carefully Root's "ABC of Beekeeping." To be successful, the beekeeper must select a suitable locality. It must be well sheltered; a bleak neighbourhood being opposed to heavy yields of honey. As they were dependent upon the various species of Eucalypts for the bulk of their honey, there should be an abundance of such trees in the neighbourhood; the greater the variety, the better for the beekeeper. The redgum gave the best honey, and the heaviest yield, while it lasted; but it only bloomed every second year. The peppermint-gum and the sandgum come next, while the bluegum is a great standby from late autumn to early spring. The bastard-gum yields honey but little inferior to the redgum. The stringybark was an uncertain quantity, and yielded a dark honey. The boxwood bushes along the creeks were of great value, as although the honey therefrom possessed an astringent flavour, the bushes blossomed when nothing else was available. While the frame hive is a necessity to anyone going in for beekeeping from a commercial aspect, the man with two or three hives will find a jam case set in a shady spot satisfactory. Whether working on a large or small scale, the beekeeper should have everything ready, waiting for the bees to swarm, as many a good swarm was lost through delay in hiving. He always placed his hives on flat stones close to the ground, with a gentle slope forward, and placed a board from the hive to the ground, to permit any bee missing the alighting board to climb in at once. The frames were covered with oilcloth, over which old newspaper was placed to keep the hive warm. In regard to foundation, full sheets were not necessary. He often cut a sheet into six strips, three wide and three narrow, and put them in alternately. He found this gave the bees a better start to raise brood, and also made straighter work than if the strips are cut the same width. Sometimes he simply put an empty frame without foundation between frames with brood or sealed honey. A golden rule with the beekeeper was to keep them at work, and to do this they must give the bees plenty of room: a top-story was almost a necessity with a hive at full strength. Honey should never be extracted until ripe, though when once it is sealed it will not improve much, and may deteriorate. Larger yields can, of course, be obtained by extracting unripe honey; but the product was inferior, and its sale had done much to lessen the demand for honey. There should be a good future for the industry, but it was suffering from lack of organisation. A good, central dépôt, with a competent manager, was required; and a strong effort should be made to popularise the eating of honey. The United States of America was probably

one of the largest honey producers of the world, yet honey was so largely eaten that it realised a much better price than in South Australia. Although most people like honey, the local consumption is comparatively small; it was far from being a universal article of diet, as it was in other countries where it was cheap. Not only was America miles ahead of South Australia in methods of production, but also in the way the honey was put up for sale, and its sale pushed in all directions. Especially in this respect was there room for improvement in this State.

Nantawarra, December 21.

PRESENT—Messrs. R. Nicholls (chair), E. J. and A. F. Herbert, Rattew, Pridham, Belling, Bierwirth, and James Nicholls (Hon. Sec.).

SHEEP IN WHEAT STUBBLES.—The Chairman reported that having a paddock of wheat badly laid by a storm, it was impossible to reap it clean, up to a bag to the acre being left in many places. On this account he was somewhat dubious about turning his sheep on to the stubbles. As an experiment he picked out 20 of the poorest, gave them a good feed and a drink, and then put them on the stubble. As they were not in any way injured by the grain he had put on 80 more. There was a dam at each end of the paddock, and the sheep were doing well. Mr. A. F. Herbert thought the Chairman exercised a wise discretion in seeing that the sheep had plenty of food and water before being put on the stubble, and instanced a case where several sheep were lost through being put hungry on to the stubble. The Chairman outlined some experiments he was carrying out to determine if possible the difference in the amounts of grain per acre harvested by the stripper and the complete harvester.

Kanmantoo, December 23.

PRESENT—Messrs. Lehmann (chair), Hawthorne, Mullins, E., R., and J. Downing (Hon. Sec.).

WHEAT HARVEST.—Members reported crops to be yielding fairly well on the whole, but very irregularly. Some portions of a paddock will return a heavy yield, while on other portions the crop was light. Members attributed this to damage by takeall.

CONSTITUTION OF ANIMALS.—Mr. F. Lehmann read a paper on this subject, dealing with the necessity for breeders giving careful attention to the constitution and temperament in the selection of stock for breeding. Members were agreed that breeders should give more thought to this question.

Koppio, December 29.

PRESENT—Messrs. Gardiner (chair), Roberts, O'Shanahan, Jacobs, Liddy, and Brennand (Hon. Sec.), and four visitors.

WEEDS.—The Chairman read a short paper, strongly recommending farmers to use every effort to keep the farm free from weeds. Members were agreed that, properly managed, a few sheep were of great assistance in growing clean crops.

SHEEP ON THE FARM.—A long discussion took place on the best class of sheep for this district, most members favouring crossing the Merino ewe with Shropshire ram.

Finniss, January 9.

PRESENT—Messrs. T. Collett (chair), S. Collett, Chibnall, and Henley (Hon. Sec.).

INDICATIONS OF WATER.—Mr. James Chibnall read a short paper dealing with the value of reeds, rushes, and timber as indicators of underground water supplies.

Davenport, December 22.

PRESENT—Messrs. Trembath (chair), Holdsworth, Hodshon, and Lecky (Hon. Sec.)

ANNUAL MEETING.—Mr. Trembath delivered an interesting address dealing with the general aims and objects of the Bureau, and the work done by the Branch during the year. During the year they had held ten meetings, at each of which a paper had been read. The average attendance of members was eight. Generally they had experienced a satisfactory year. Retiring officers were thanked and re-elected, a vote of thanks being accorded to the editor of the local paper for his assistance.

RAISING CHOICE SEEDLINGS.—Mr. Hodshon read a paper on this subject:—"First get a box or pot and put in a layer of broken pots for drainage, then a layer of good sandy loam and well decomposed stable manure sifted through a half-inch sieve. Make the soil bed level and press down; then sow the fine seeds very thinly on the surface, and sift over sufficient fine soil to well cover the seed. Water with a very fine rose sprinkler, and keep the surface always moist. The young seedlings under this treatment will speedily reach the light. If glass is used as a cover it will be necessary to let the air in during the day. After the seedlings are up lift the glass sufficiently high for the admission of an abundance of air. The main points to be regarded in transplanting are:—Care in removing the plants so as to prevent injury to the tender roots, planting 'firmly' so as to enable the plant to take a secure hold of the soil; reduce the top a little if the plant is larger than it should be; and especially if it has been grown in a thickly sown seedbed. Thick sowing breeds spindly and tender plants, and under these conditions quite one-half of the plants can be pinched off. Water thoroughly, and shade the transplanted plants for three or four days from the sun. Use green twigs, or light frames, like bee frames. Tack calico or scrim over each frame, and hinge together with leather straps. They should be about 12 x 8 for single plants; but they can be made any length, with light laths, for protecting rows of early plants from frosts, and afterwards to shade them from the sun."

EXHIBITS.—Mr. Hodshon tabled several samples of vegetables, bee frames attacked by the bee moth caterpillar, and partially constructed combs abandoned on account of attacks by ants.

Virginia, December 19.

PRESENT—Messrs. Hatcher (chair), Stempel, D. J. and J. E. Sheedy, J. E. and S. J. Taylor, Huxtable, White, Nash, and Ryan (Hon. Sec.).

FARM HORSES.—Mr. W. White read a short paper on "Management of Farm Horses."

QUESTION BOX.—The following questions, asked through the box, were answered:—**Complete Harvester**.—Members who have used the complete harvester expressed themselves as well satisfied with its work. **Pollarding Gum Trees**.—Members were of opinion that this work is best done in the spring. **Dart's Imperial, or Bluey, Wheat**.—Members advocated early sowing of this variety.

Mallala, January 9.

PRESENT—Messrs. W. Temby (chair), S. Temby, Wilson, Moody, McCabe, Murphy, Worden, Latten, Jenkins, Hancock, Marshman, and Nevin (Hon. Sec.), two hon. members, and one visitor.

HARVEST RESULTS.—Members reported on results of recent harvest, which, on the whole, were very satisfactory. But for damage by late frosts and the dry spell in October many crops would have yielded six bags per acre. The average of the district was estimated at 16 bushels. The complete harvester has been largely used and has given satisfaction; in fact, most of the members were of opinion that before many years the harvester would supersede the stripper. The best wheats for this district are Marshall's No. 3 and Gluyas.

CATTLE COMPLAINT.—Considerable discussion on losses of cattle from im-paction, etc., took place, the general feeling being that, in view of the serious losses of late years, the Government should have a thorough enquiry made

into the cause of the trouble. Mr. Moody stated that three cattle he had recently lost showed the usual outward symptoms, viz., stiffness in walking, strong fluid running from mouth, tongue hanging out, and jaw paralysed. The "bible," or omasum, was not dry, but the gall bladder was much enlarged. Instances were given where cattle fat enough for killing were lost. Mr. Jenkins stated that until recent years he frequently lost cattle from impaction, but since adopting precautionary measures he had had no losses. He made a mixture of 5 parts salt and 1 part sulphate of iron, and twice a week mixed about a panniculus of this with the food of each cow.

Morphett Vale, January 17.

PRESENT—Messrs. Christie (chair), Perry, Pocock, Sullivan, and Anderson (Hon. Sec.).

ROUP IN TURKEYS.—The Chairman reported that he had lost several young turkeys recently. The main symptoms were swelling of the head and violent fits of sneezing. All the affected birds succumbed. [Mr. D. F. Laurie states that the birds were attacked by roup—a highly contagious disease—and recommends the following treatment:—Isolate all affected birds, and house them in a warm, dry, well-ventilated coop. Give each bird about half a teaspoonful of olive oil, to which five drops of eucalyptus oil have been added; also smear some of this over the nostrils and head. This treatment should be continued for several days. The coop should be sprinkled with eucalyptus oil, and the birds fed on bran and pollard, flavoured with ground ginger. A little chopped onion or garlic should be added to the food.—ED.]

Clarendon, January 9.

PRESENT—Messrs. Spencer (chair), Phelps, Juers, Hilton, Pelling, Pigott, Harper, and Wright (Hon. Sec.).

MANURE REPORTS.—Most of the members reported on crop results. Generally mineral super had not given satisfactory returns in the hay yields. One member had better results from a mixture of super and bonedust than from either alone, but another member stated that where this mixture was applied the crop was not satisfactory. Too much wet during the winter months was thought by some to be the cause of failure, while the Chairman attributed poor results to insufficient organic matter in the soil, and would like the opinion of the Professor of Agriculture on this point.

DRYING FRUIT.—Mr. Pelling read a short paper on this subject. He was satisfied that it would pay better to dry apricots when the price falls below 3s. per case than to sell them in the market fresh. There was not a great deal of labour attached to the drying operations, and where there was a family the children could do most of the work. Good, clean, sound fruit was required for drying. The same thing applied to apples; it would pay much better to dry the best of the windfalls than to feed them to the pigs. To secure dried fruit of a good colour, sulphuring in a small room or large box was necessary. For trays he found branbags cut open better for the bottom than laths; he used only four laths to hold the end pieces of the tray together, and tacked the bagging over them.

Kingscote, January 9.

PRESENT—Messrs. Turner (chair), P. T. and C. J. Bell, Olds, Bates, Melville, Nash, Wright, Dewar, Ayliffe, and Cook (Hon. Sec.).

SHEEP ON THE FARM.—Mr. Dewar gave an interesting address on this subject. Where they had sufficient feed to keep up the frame, he would advise going in for purebred, large-framed Merino sheep, though he would rear a few cross Shropshire-Merino ewes for lamb-breeding. He believed in keeping the sheep in small flocks, and was satisfied they would pay better than breeding cows or horses.

Wilmington, January 18.

PRESENT—Messrs. Robertson (chair), Zimmerman, Schuppan, McLeod, Broadbent, Bauer, A. and M. Bischof, Maslin, and Payne (Hon. Sec.), and one visitor.

MEMBERSHIP.—At previous meeting a long discussion took place on the decision of the Council of Agriculture to widen the constitution of the Bureau. It was resolved that the election of proposed new members be carried out under following conditions:—1. That new members, or retiring old members, may be nominated either by themselves or by a member of the Branch, and that election be by ballot only. 2. That the new members must receive the votes of two-thirds of the members present on the night of the election. 3. That nominations be received at one meeting, and the ballot take place the following month, the Hon. Secretary to indicate on postcard calling meeting the names of the nominations to be balloted for. Members desire that the Council of Agriculture should alter the rule that new members must be approved by two-thirds of the members of the Branch to two-thirds of those present on night of election.

EARLY REAPING.—Some discussion on the results of early reaping took place, it being stated that wheat harvested and bagged early had shrunk appreciably. Mr. McLeod said that wheat was often reaped by the complete harvester before it was thoroughly ripe; there was not only a risk of the grain in the bags sweating, but they would find green grains present.

MANURES.—The Chairman and Mr. Bauer reported on experiments with manures for wheat. The former used a mixture of guano and mineral super in quantities varying from 50 lb. to 100 lb. per acre; but neither in the growth of the plant nor in yield could he see any benefit from the heavier dressings. With their variable rainfall, he was satisfied that it was not advisable to apply more than 50 lb. of super per acre. Mr. Bauer's experiments indicated that while 120 lb. of super per acre increased the crop from 4 bushels 44 lb. per acre on the unmanured plot to 6 bushels 8 lb., the cost of the manure was greater than the value of the increased crop, and the same was the case with lighter applications. Members generally agreed with the Chairman that, while the application of 50 lb. per acre of manure increased the yield appreciably in this district, their experience was that any heavier dressing was a waste of money.

DEEP PLOUGHING.—The Chairman called attention to recent report on the beneficial effects of deep ploughing. He was convinced that it would be beneficial to occasionally break up some of the subsoil and mix it with the alluvial soil on the surface, especially where fertilisers were used. Several members agreed on this point.

DAIRYING.—Mr. P. H. Suter, Dairy Instructor, was present by invitation, and spoke shortly on the dairying industry. He specially referred to the necessity for delivering the cream early and in good condition to the factory. The local butter factory was referred to in complimentary terms.

Port Pirie, January 14.

PRESENT—Messrs. Smith (chair), Teague, Hector, Humphris, Morrish, Jose, Holman, Johns, and Wilson (Hon. Sec.), and two visitors.

THE FARM OF THE FUTURE.—Paper on this subject read at previous meeting was discussed, and generally agreed with. Closer settlement was, however, considered impracticable in the dry areas. Some difference of opinion existed as to the effect of bare fallow in liberating plant food and conserving moisture. It was agreed that early fallowed land should be ploughed deep, and the late fallow shallow.

ANNUAL REPORT.—Thirteen meetings held, with an average attendance of nearly eight members. Four papers were read and discussed, and at two meetings articles in *The Journal of Agriculture* were criticised. The Hon. Secretary referred to the poor average attendance, and thought there was need for the introduction of some element to act as a stimulus to members. The present position was not satisfactory to the officers.

CONFERENCE.—It was decided to postpone the Conference of Northern Branches until February 23.

Onetree Hill, January 19.

PRESENT—Messrs. J. Bowman (chair), F. Bowman, Blackham, Blake, Cowan, Flower, Ifould, Kelly, and Clucas (Hon. Sec.).

HORSE-SHOEING.—Considerable discussion on this subject took place. Most members have their horses shod monthly; but several made it a practice to change the shoes once a fortnight. It was agreed that beyond taking care that the hoof did not suffer from neglect, no hard-and-fast rule as to how long the shoes should remain on could be laid down.

LAND MEASURING.—The Hon. Secretary said farmers frequently found it necessary to measure off portions of their property, and it was therefore desirable that they should be able to do their own measuring, or be in a position to assure themselves that it had been done accurately. He showed how the haphazard methods in general use by farmers invariably resulted in inaccuracy, and explained the use of the cross-staff and diagonal scale.

Strathalbyn, January 16.

PRESENT—Messrs. M. Rankine (chair), W. M. Rankine, Reed, Tucker, Cockburn, Watt, and Cheriton (Hon. Sec.).

SOUTHERN CONFERENCE.—Favourable replies having been received from a number of Branches, it was decided to hold the twelfth annual Congress of Southern Branches at Strathalbyn on Thursday, March 30. Delegates reported on proceedings of Woodside Conference.

STALLION TAX.—A long discussion on this subject took place, but no resolution for or against the proposal was carried.

Balaklava, January 14.

PRESENT—Messrs. Manley (chair), Anderson, Black, Neville, Spillane, Thomas, Goldney, and Burden (Hon. Sec.).

MOTOR-POWER ON THE FARM.—Some discussion ensued on the reading of a paper on the use of agricultural motors for farming operations. Members generally were agreed that the average holdings would have to be larger than at present to warrant the outlay; but they would like to see one of these motors at work in the field. It was agreed that for chaffcutting, etc., the oil engine was much superior to the horseworks.

Koolunga, January 19.

PRESENT—Messrs. Butcher (chair), Shipway, Sandow, Burgess, Fuller, Jose, Buchanan, Palmer, Butterfield, and Noack (Hon. Sec.).

SEED WHEAT.—Mr. J. Sandow read a paper on this subject. It must be admitted that the selection and treatment of the seed wheat was one of the most important subjects that the farmer has to deal with. It was admittedly a difficult matter to deal with, as there were so many varieties of wheat to select from, many of which were very favourably reported on. He would advise growing small quantities of the best kinds to find out which suited the farm best, as wheats that do well in one locality may not succeed in another in close proximity. It was not sufficient to test a variety for one year only, as some would not give satisfactory results until the second, or even third, season. The seed should always be cleaned thoroughly, to remove all foreign seeds, chaff, and whiteheads. A mistake was often made in sowing early maturing wheat early in the season, in order to get green feed; although fed off during the winter, these wheats would come into head weeks before it was advisable. He would sow the late wheats first, and with favourable weather feeding down with sheep will do good. The medium wheats should be sown next, and the earlier varieties at the finish. When sowing clean seed on dry ground it was not necessary to pickle; but when the ground is damp only pickled seed should be sown. Bluestone or formalin should be used for treating the seed; he preferred the latter, as it did not injure the grain so

much, was a preventive also of black rust, and the seed so treated ran more freely through the drill. If either pickle was used too strong, the germinating power of the seed was injured. He also thought either pickle would injure the seed if treated too long before it was sown. Wheat for seed should be winnowed two or even three times before being bagged, if at all smutty, otherwise the smut balls will get broken in the bags, and all the seed will become contaminated. In the discussion which ensued there was some difference of opinion as to pickling seed wheat—when to pickle and the quantity of bluestone to use. Several members advocated the use of formalin.

Cherry Gardens, January 10.

PRESENT—Messrs. Lewis (chair), Jacobs, Partridge, Wright, and Ricks (Hon. Sec.), and one visitor.

DAMAGE BY HEAT.—The effects of the recent heat wave, which members consider the worst experienced in this district, were discussed. Very heavy losses of fruit through burning and dropping were reported: walnut trees, especially on damp soil, were badly burnt. The foliage of most fruit trees has suffered severely.

Lyndoch, January 20.

PRESENT—Messrs. Ross (chair), Warren, Mitchell, A. and H. Springbett, Woolcock, Rhen, Schenke, Rushall, and E. Springbett (Hon. Sec.), and three honorary members.

BUREAU SHOW.—It was decided to hold the annual show of products of the district under the auspices of the Branch on February 22.

CODLIN MOTH PARASITE.—Mr. Woolcock stated that he had found some codlin moth chrysalides in poor condition, due to the presence of the eggs of some parasite. Members stated that generally the codlin moth was not so destructive as in former years; but whether this was due to the excessive heat and dryness, or to some other cause, members could not decide. It was agreed that to get the best results spraying must be continued right through the season.

WOOLLY APHIS.—Mr. Warren stated that he had seen the Woolly aphis, or American blight, on apple trees destroyed by fumigating with tobacco smoke after covering the tree with a tent. Mr. Ross used fresh lime for this pest with satisfactory results.

Crystal Brook, January 14.

PRESENT—Messrs. Hamlyn (chair), Dabinett, R. and P. Pavy, Hutchison, Davidson, Solomon, Venning, Miell, and Symons (Hon. Sec.).

VARIETIES OF WHEAT.—Mr. W. Hamlyn read a paper on "My Experiences with Different Varieties of Wheat." During his residence in this district he had grown a large number of varieties of wheat, but, owing to various faults and defects, he had discarded all but three or four. Of the wheats tried he would place Carmichael's Eclipse first, as he had grown it for seven years without a failure, and mostly it had yielded better than any other wheat. During each of the past three seasons it had yielded 20 bushels or more per acre. It was very early, a quick grower, withstands storms fairly well, and one of the most rust-resisting wheats grown. It was not suitable for hay; stock did not care for it. He placed Gluyas wheat second. It was early, very rust resistant, a good yielder, and a fair hay wheat. Its one fault was its tendency to go down, but he believed this could be overcome to a certain extent by sowing rather late and thickly—up to 1½ bushels per acre. Off 50 acres, which could only be reaped one way owing to the storm in October last, he had reaped an average of nearly 21 bushels, besides which a lot of grain was lost. Although he had only grown Marshall's No. 3 and Comeback for one year he was very favourably impressed with them. A year or two ago he would have given Phillis Marvel a high place, but this past year it was badly rusted, and only yielded 14 bushels per acre. Baroota Wonder had given him good results for a number of years, but last season was disappointing, as, although it looked well enough for 20 bushels, the actual yield was only 14.

Whyte-Yarcowie, January 21.

PRESENT—Messrs. Dowd (chair), Faul, Hunt, Jenkins, Mudge, Pearce, Lock, and Boerke (Hon. Sec.), and one visitor.

WATER CONSERVATION.—Mr. J. A. Lock initiated a discussion on the conservation of water for irrigating small areas on the farm. He advocated the construction of large dams by the farmers, and as the cost of such work by manual labour was too great, he thought the Government might be asked to supply steam scoops and ploughs, making a charge sufficient to cover cost, etc. There were millions of gallons of water going to waste each year in this district, and he was satisfied that many farmers would be glad to avail themselves of the opportunity of hiring suitable machinery for dam-sinking at a moderate cost. It would certainly be to the advantage of the Government to encourage the farmers to conserve water in districts not served by reservoirs.

WHEAT CROPS.—Members reported on varieties of wheat grown during the past season. Marshall's No. 3 was generally considered the best for this district, Rerraf, Dart's Imperial or Bluey, Comeback, Gluyas, and Smart's Early being placed in the order given. Gluyas breaks down too easily, while Smart's Early appears very susceptible to smut, hence their low positions on the list.

Mount Gambier, January 14.

PRESENT—Messrs. Edwards (chair), Wedd, Mitchell, Bodey, Williams, Wilson, Ruwoldt, Kennedy, Watson, Burrows, Schlefel, Norman, and Collins (Hon. Sec.), and one visitor.

LAMB-BREEDING.—Considerable discussion on this subject took place. Mr. Edwards thought the lamb-rearing industry one of the most reliable and profitable they could take up in this district. So far as breeds were concerned, he got the best results from Dorset-Horn rams, crossed with full-mouthed three-quarter-bred Lincoln ewes. He got better prices for his Dorset-Horn lambs than for any others. This season he received 11s. each after shearing. These sheep were very docile and contented, and matured quickly. They were hardier and healthier than the Shropshire, though rather coarser in the bone. The wool also was not as good as that of the Shropshire. Mr. Kennedy thought the better wool from the Lincoln crossbred more than compensated for any deficiency in the lamb. He got 10s. 9d. for his lambs, off the shears. The Hon. Secretary pointed out that the buyer for one of the largest exporters of lambs had a decided preference for the Lincoln and Shropshire crosses. Mr. Williams referred to the value of the Romney Marsh sheep for crossing with the Merino. Messrs. Feuerherdt, of Lucindale, had done well with these sheep. The wool was of high quality and the lambs good. The Romney Marsh sheep would do on poor country, where Lincolns would not, and they would also do well on marshy land, where other breeds suffered from footrot and worms. Mr. Ruwoldt spoke highly of the Romney Marsh cross. Most of his Romney ewes last year bore twin lambs. The lambs, though small at first, grew very fast, and at eleven weeks old were equal in size to any others. He had sold some of their lambs weighing 130 lb. at eight months. Other members favoured the Shropshire and Lincoln crosses, and it was agreed that with good breeding and good feeding satisfactory results would be obtained from any of the crosses mentioned.

Wandearah, January 9.

PRESENT—Messrs. Munday (chair), Dick, Wall, Birks, Robertson, Davidson, E. H. and E. J. Eagle (Hon. Sec.).

RABBIT DESTRUCTION.—The rapid increase of rabbits throughout the district, and the necessity for united action to cope with the pest, were discussed at length. It was agreed that poisoning when the feed was short was the best method of dealing with the rabbits, the present being a very suitable time for work. Several of the members formed themselves into a syndicate to purchase a poison-distributing cart, to be used in rotation.

Quorn, January 21.

PRESENT—Messrs. Thompson (chair), Brewster, Toll, McColl, Noll, Rowe, and Walker (Hon. Sec.).

RABBIT DESTRUCTION.—Considerable discussion on this subject took place, members being agreed that the enormous losses caused by vermin were of great moment, not only to the individual States, but to the Commonwealth as a whole. A recent judgment of the South Australian Supreme Court in a case brought against a resident in this district indicated that the local authorities were practically powerless to compel landholders to carry out the provisions of the various Acts dealing with rabbits, the result being that those who obey the law are practically at the mercy of those who break or ignore it. It was resolved that the Government should be urged to amend the Vermin Acts as early as possible in order to make them effective.

Saddleworth, January 20.

PRESENT—Messrs. J. H. Frost (chair), Baldwin, Benger, J. H. and T. Eckermann, W. T. Frost, Klau, Plant, Klem, Scales, and Coleman (Hon. Sec.).

CATTLE COMPLAINT.—This Branch strongly supports the request of the Council of Agriculture that the Government should depute a competent veterinary to enquire into cause of impaction, etc., in cattle.

BLEACHED SEED AND SMUT.—Twelve months ago considerable discussion took place on the question of sowing bleached wheat unpickled. One member reported that he sowed 70 acres with unpickled bleached seed, and had a clean crop, but the seed remained in the ground for three or four weeks before sufficient rain fell to cause germination. Other members who sowed this seed unpickled had smut in the crops. The Hon. Secretary pickled with formalin, which delayed germination for several days longer than did bluestone pickle.

Koppio, January 19.

PRESENT—Messrs. Gardiner (chair), A. and D. Howard, Jacobs, Borthwick, O'Shanahan, Newell, Liddy, Miller, Richardson, and Brennand (Hon. Sec.), and four visitors.

FODDER PLANTS.—Some discussion took place on what fodder crops could be grown in this district, but members have so little experience in this matter that no definite information was elicited.

MANAGEMENT OF FARM HORSES.—Mr. J. O'Shanahan read a short paper on the care and management of working horses. It was essential that the horses should be firmly but kindly treated. Even the most timid horse will become quiet and tractable as soon as it learns that it has nothing to fear from its master. Do not permit the drivers to jerk the mouths of the horses with the reins, as it makes them fret and lose condition. Groom each animal night and morning, as it will not only improve its appearance, but also its health. Provide good clean water, as the horse is naturally particular as to what he drinks. He preferred to feed chaffed hay to his horses when in hard work, as they waste less, and the owner could gauge better what he is giving each animal than he can with long hay. When taking the horses out of harness give a small feed of oats and chaff; then fill up the feed boxes about 8 o'clock at night. Their horses kept in splendid condition all the year round on a daily ration of 40 lb. of chaffed hay and 3 lb. oats when in work. When not in work they received a good sheaf of hay in addition to what they picked up in the paddock. They found hay cut when the crop was well forward was much better than green hay. Care must be taken not to feed too much oats: 2 lb. to 3 lb. daily was plenty. For young horses give a feed of cocky chaff and oats (1 lb. oats per horse) once a day in addition to the grazing, which should be good.

NITROGEN-FIXING BACTERIA.—Mr. O'Shanahan read extract dealing with the action of nitrogen-gathering bacteria, and it was decided to write to the Department of Agriculture for information on the subject.

Riverton, January 21.

PRESENT—Messrs. A. J. Davis (chair), W. B. Davis, Camac, Gray, Calf, Badman, Hannaford, Kelly, and Cooper (Hon. Sec.), and three visitors.

FORMALIN FOR PICKLING WHEAT.—Some discussion on this subject took place, and as all present had lost considerably by the ravages of black rust, it was decided to ask that full particulars of treatment with formalin should be published in *The Journal of Agriculture*. [Particulars of this treatment were published in April, 1904, issue, page 500; also January, 1905, issue.—Ed.]

CROPPING STUBBLE LAND.—Mr. E. Kelly read a paper on this subject. He contended that in this district, stubble land was unprofitable. It cost quite as much to get it ready for seeding as did fallow land, and yielded on an average six to eight bushels per acre less. Cropping stubble land resulted in the increase of weeds, whereas fallowing should ensure a clean crop. Where the land has been fallowed the preparation of the ground has been extended over a period of seven or eight months, but with stubble land the same amount of work has to be done during, say, three months; perhaps to be interfered with by lack of rain, etc. He quoted figures dealing with the cropping of 300 acres annually under two systems:—1. Half fallow and half stubble. 2. All fallow. He estimated the cost under the first method of ploughing, harrowing, seeding, and harvesting at £330, and the returns, viz., 12 bushels on stubble and 20 bushels on fallow, £720, leaving £390 balance. The expenses do not include rent, taxes, wear and tear, sacks, etc., but this does not affect the comparison. If the whole area was fallowed the cost would be, say, £350, and the return £900, leaving a profit of £550, or £160 more than under the system of half stubble and half fallow. He was satisfied from practical experience that, while the actual figures would vary according to season and conditions under which the farmer is working, in a general way the results would work out somewhat as he had indicated.

Lucindale, January 28.

PRESENT—Messrs. E. Feuerheerdt, Dow, Carmichael, Tavender, B. Feuerheerdt, Matheson, and Beaton (Hon. Sec.).

STOCK COMPLAINT.—Mr. Carmichael stated that he had a young fat colt that had become ill in a few days, and had difficulty in passing excreta. Drenches were given with no relief, but an injection of soapsuds gave immediate relief, and the horse improved. There were other horses in the same paddock, but were not similarly affected. [Veterinary Surgeon Desmond states that this is a case of impaction of the rectum, which is dealt with in the article on "Stomach and Bowel Disorders of the Horse," in this month's issue.]

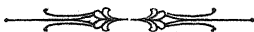
SHEEP DIPS.—Mr. Feuerheerdt thought that the best dips were those known as the arsenic dips; the non-poisonous dips did not keep the sheep free from ticks. Mr. Tavender preferred the home-made arsenic dips. Members all agreed that plenty of time should be given for dipping, and the length of the wool should be the guide for the time the sheep should remain in the dip.

Clare, January 20.

PRESENT—Messrs. Birks (chair), Jarman, Kimber, Martin, and Dall (Hon. Sec.), and one visitor.

ENSILAGE.—Mr. Jarman read a paper on this subject, to the following effect:—Ensilage may be defined as a method of preserving green fodder so that it retains a large percentage of its feeding value, and when used should be succulent and digestible. Though horses and sheep could with advantage be given a little ensilage in summer, it is more suitable and best serves its purpose when fed to dairy cows. He was of the opinion that ensilage prevents impaction in cattle, and this was a point in its favour when counting the cost of making. By experience he thought that pit ensilage was better than stack, as in the latter there was more waste. For a small farm a useful silo would be 12 ft. x 12 ft., and 15 ft. deep from top of wall, which should be built at least 3 ft. above the surrounding land. This would prevent sand,

etc., falling down, and keep stock out. A pit of these dimensions should hold from 25 to 30 tons. The stuff used for making ensilage should be cut in a more succulent stage than when cut for hay, as if it becomes too dry it is more likely to go bad. A wheat crop to be used for ensilage should be cut about a week after the bloom has fallen. Patches of wild oats, charlock, poppy, dandelion, or cockspur are usually found on the best farms, and, provided there is at least 50 per cent. of cereal, good ensilage can be made out of such a crop. This does satisfactory work in cleaning the land, improving the sample of the remaining crop, and making good food of what would otherwise be wasted. Cart the stuff to the pit as soon as it is cut. Fill in about four feet the first day, and tramp down to an even density. Leave this until the temperature rises to 122 deg. Fah., which can be ascertained by making a hole in the mass with an iron bar, and testing with an ordinary dairy thermometer. Should the temperature rise beyond 140 deg. Fah., the ensilage will char or blacken. Repeat this till the pit is filled about four or five feet over the top. As soon as the temperature has risen sufficiently high in the last layer, put on about one foot of straw (as it generally goes bad to this depth), and then apply the weights, which should not be less than 1 cwt. to the square foot. This means about seven tons on a surface of 12 ft. x 12 ft. It is an advantage to have jarrah boards 6 in. x 2 in. to lay on the top of the straw to support the weights. Any heavy material, such as stones, logs, etc., can be used as weights. As the stuff is being put in the silo it is advisable to sprinkle about 10 lb. of coarse salt over each wagon load. Considerable discussion ensued, and members were of the opinion that it would well pay stockowners to put down a pit of ensilage, especially for dairy cows, as it was a most nutritious and profitable food for all stock.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

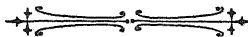
Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from January 1 to January 30, 1905.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	82	139	363
Masons and bricklayers	—	1	—
Carpenters	15	2	22
Painters	3	—	2
Plasterers	1	—	—
Boilermakers and assistants	1	—	1
Blacksmiths and strikers	4	—	2
Fitters and turners	4	1	—
Enginedrivers and firemen	1	—	—
Moulders	—	1	2
Brassfinishers	2	—	2
Compositors	2	—	—
Cooks, etc.	—	—	2
Apprentices	21	4	1
Cleaners	5	16	2
Porters and junior porters	15	11	1
Rivet boys	2	—	—
Totals	158	175	400

January 31, 1905.

A. RICHARDSON, Bureau Clerk.

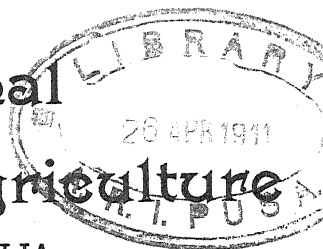


The Journal

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OF SOUTH AUSTRALIA.



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RICHARD BUTLER,
Minister of Agriculture.

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GENERAL NOTES.

Formalin for Pickling Seed Wheat.

Formalin was used last year by a large number of farmers as a pickle for the prevention of bunt or smut, and the disease known as black rust. Most of the reports made by Bureau members are satisfactory, though a few mention that the germination of the grain has been injured, especially where the seed was not sown for several days after pickling. One Branch reports absolute failure of the treatment, except in the case of two members, and in the discussion which ensued it was elicited that, with the exception of these two, the formalin was purchased in the local township. From Victoria reports of serious adulteration of formalin come to hand. In view of these results too much emphasis cannot be laid on two points:—

1. Insist on obtaining Schering's formalin in original, unopened bottles.
2. Use at strength of 1 lb. formalin to 40 gallons of water; any stronger solution will probably injure the grain.

The seed can either be pickled on a wooden floor, as with blue-stone, or by dipping the seed in the solution for five minutes. After pickling spread the seed out in a thin layer to dry. From the number of complaints made it would appear possible that some injury results if seed pickled in formalin is kept in the bags for several days, though the action of formalin in this respect is not quite understood. This season, however, it is intended to make a searching investigation into this and other matters connected with the use of various pickles for seed grains. It is also intended to obtain samples of formalin from various centres for analysis, as there is good reason to fear that in South Australia, as elsewhere, this substance is frequently adulterated.

Importation of Fertilisers.

Large shipments of fertilisers have reached South Australia during the past two months. Altogether ten full cargoes, varying from 2,000 tons to 3,500 tons, have arrived, besides a large number of smaller consignments. Taken altogether the supplies have come to hand earlier this year than for several years past, and although there is not likely to be such a shortage at the end of the season as there was last year, farmers would be well advised to place their orders for any additional supplies required as early as possible. A number of farmers who delayed this until late last season found to their cost that there had been a considerable increase in the price. On another page the results of analyses of samples of fertilisers taken by the Inspector of Fertilisers are published.

Markets for Fruit.

The low prices realised by our fruit last year in London has caused growers and exporters to devote considerable attention to the opening up of new markets. In view of the increase in Australian exports, it is unlikely that we will secure in the future the very high prices realised a few years ago for our apples, but there should undoubtedly be a much larger demand developed in Europe than at present at a price that will pay the growers. Costs of freight, etc., must be reduced, and efforts made to get into direct contact with the markets of the larger cities of Europe and elsewhere. In this connection it might be mentioned that the members of the South Australian Fruitgrowers' Association are sending trial shipments of pears and apples to Vancouver to test the market there. A strong co-operation of growers to take this work in hand would be of manifest advantage.

Inspecting Fruit for Export to Europe.

An increasing number of our fruit exporters are utilising the services of the officers of the horticultural branch of the Department for the purpose of reporting upon the condition of their produce before it is put on board the boats. With each consignment that in the opinion of the inspecting officer is in a condition suitable for export a certificate is issued, and this is posted to Europe with the other papers connected with the consignment. While the officer only gauges the carrying condition of each lot, a concise report is given to the exporter embodying his opinion respecting the general qualities of the varieties, and the methods of grading and packing followed, with suggestions for improvement wherever defects are seen. Those who have used the officials as umpires in this way during the previous seasons state that with few exceptions the opinions of the Inspector have proved reliable. To the commercial man who enters the exporting business without expert knowledge of the details of varieties to send, and the preparation of the same for shipment, it is no doubt an advantage to be able to secure an absolutely impartial person to act as umpire between the grower or dealer who packs the fruit and the merchant who buys it for export. Upwards of 1,200 cases have been examined in this manner for the first two fruit-carrying steamers this year.

Inspection of Fruit for Interstate Markets.

As showing the wide variety of South Australia's fruit production, it may be mentioned that during the past four weeks the Inspectors certified to the freedom from diseases of 11,233 bushels of fruits, which were made up of 19 kinds, all but three of which (357 bushels) were locally grown. At the same time 3,750 packages of vegetables and eight parcels of living plants were passed for

export. The imports consisted of 3,635 bushels of fruits, made up chiefly of bananas, with a few pineapples, passion fruits, oranges, and lemons to make up the balance. Of these 166 bushels of bananas were destroyed owing to over-ripeness. Out of 69 parcels of plants submitted for inspection two were detained owing to not satisfying the requirements of the law.

Codlin Moth Parasites.

Considerable attention has been given by the Australian press to the alleged discovery in Spain of a parasite which keeps the codlin moth in check, and some writers appear to hold the opinion that if we can introduce this parasite and get it distributed through our orchards the codlin moth question will be settled. This view, however, is far from being justified by our knowledge of the work of these parasites. Quite a number of insects are known by American entomologists to prey on the codlin moth at some stage of its existence, but their united efforts do not materially lessen the loss of fruit due to codlin moth attack. In this State two or three parasites have been found attacking the caterpillars of the moth. Several observers report finding caterpillars in which are the eggs or grubs of some fly, probably one of the ichneumon flies. These grubs entirely destroy their host, and only the head and part of the skin are left. Wasps have also been credited with the good work of carrying off the caterpillars, and in some instances beetles attack the larvæ in the bandages. Without in any way belittling the value of these natural enemies, there is no question that the grower who wishes to avoid loss from codlin moth attack must keep the spray pump going. The fear has been expressed in some quarters that arsenical spraying will destroy the natural enemies of the codlin moth, but, so far as we know them, the habits of the locally observed parasites remove any possibility of their being poisoned in this way.

The American Woolly Blight.

During the two summers which preceded this one the temperature was generally low, and summer showers frequently fell. The same two summers marked the first period through which it could be claimed that a general use of the soda-lime arsenite was adopted against the codlin moth pest. Simultaneously with the above an unusual increase in the spread of the American blight (*Schizoneura lanigera*) took place throughout the orchards of the State. During normal seasons two ladybird beetles (*Coccinella repanda* and *Leis* or *Coccinella conformis*), chiefly the latter, assist largely in repressing this pest. These predaceous friends of the apple grower have not, it is reported, been so plentiful during the last three seasons in the apple orchards, although one observant orchardist states they

frequent the neighbouring peach and other stone fruit trees as in former times. It has been freely advanced that owing to the spraying with arsenical washes the ladybirds have been driven from the apple trees, much to the advantage of the woolly blight. Whether the spraying had this effect remains to be proved by more accurate methods of investigation than inferences drawn from such data. The writer has observed in one orchard where the apple trees have neither been sprayed nor cultivated for the last four seasons a similar increase in the attacks of the woolly blight. While this may prove nothing to the contrary it stands on a par with the arguments referred to above. Viewed from a general standpoint we find this pest troublesome in all parts of the globe where cool, moist summers prevail. It is to be expected, therefore, that whenever our orchard districts experience these conditions a fresh impetus will be given to the breeding propensities of this pest. In the average run of seasons, when our dry heat often exceeds 100° Fahr. in the shade, the woolly aphides are shrivelled up if at all exposed to its influences. In the summer of 1894-5 the writer saw the finely tilled soil beneath old gnarled apple trees literally strewn with dead aphides when the shade temperature passed the 100th degree for three days in succession. The recent high temperatures repeated this experience in many localities, and although in other respects such summer heat may injure the prospects of the fruitgrower, in this direction it offers compensations of a valuable character.

The Summer Treatment of Fruit Trees.

Between January 18 and February 21 Mr. Quinn has travelled through most of the leading fruitgrowing centres, and has given public and private lessons and demonstrations in the theory and practice of summer pruning of fruit trees. Public exhibitions of this work have been given at Wirrabara Forest, Laura, Angaston, Clare, Penwortham, Watervale, Woodside, Lobethal, Coonawarra, and Willunga. With one or two exceptions these gatherings comprised the leading commercial fruit producers in the neighbourhood, and much interest was shown in the work. Mr. Quinn reports there is evidence that the growers are showing a much greater desire to test new practices than hitherto.

Orchard Inspection.

The fruitgrowers in the Clare district are the only ones who seem sufficiently alive to the importance of making the careless man look after his diseased trees. As a result of their representations, Mr. W. Kelly resumed his visits of inspection and persuasion, with the result that old, useless trees have been destroyed, and others more valuable have received attention either by the destruction

of all the fruits or of the diseased specimens from time to time. During the period covered from January 31 to February 17 Mr. Kelly has occupied $6\frac{1}{2}$ days at this work, and visited 69 orchards and gardens in that time. He reports a considerable diminution of the codlin moth as compared with other seasons; this he largely attributes to the effects of the high temperatures which have prevailed.

Market for Sheep and Rabbit Skins.

Despite the fact that at the January series of the London wool sales Merino wool showed a slight decline, sheepskins at the Adelaide sales have well maintained the high levels which have been ruling. Rabbit-skins, however, on account of the tremendous quantities sent in to the various markets, have considerably declined, and as a consequence comparatively few are now being offered for sale. Presumably it does not pay in many quarters to skin the rabbits when prices are low.

Drinking Water for Poultry.

At this season of the year particular attention must be paid to the drinking water, and the vessels used for this purpose. The water should be cool and fresh, and twice a day, or more often if necessary, the vessels should be cleansed and filled. Keep a strong solution of permanganate of potash, and occasionally add enough of this to the drinking water to give it a marked tinge. Earthenware vessels are the best. Use no vessel which cannot be readily cleaned and disinfected.

Green Food for Poultry.

Rape should be sown at intervals. A small piece of well-enriched soil and a moderate provision of water will give better results than a large area of poor ground ill attended to. Cabbages make excellent food during the winter. It is time to sow the seed. Sow some kail (thousand-headed and Jersey). Green food is of far greater value than is generally supposed. It is medicinal, and therefore promotes health. It is a good egg-producing food, especially the cabbage tribe. It supplies bulk, which is so often lacking in the general run of poultry foods. Windfall apples and pears may be sliced or pulped and fed to the birds with excellent results.

Grit, Charcoal, etc.. for Poultry.

Except in certain localities the soil does not contain sufficient grit for the needs of the birds. This is especially the case where the birds are penned. Always have a supply of sharp, hard grit in a small shallow tin or box. Shell grit is, as a rule, too soft; hard, sharp, quartz grit is

to be recommended. Broken charcoal, about the size of split peas, should also be provided. It is eagerly eaten by laying hens, and may be regarded as an excellent aid to digestion. The charcoal should be kept quite dry, as if damp its antiseptic properties are largely diminished.

Overcrowding Poultry.

The majority of poultry breeders endeavour to rear more birds than they can attend to. Fewer birds brought to a high state of perfection will give more satisfactory results in every way. One need only inspect the pens of poultry offered for sale at auctions and in the markets to be convinced that the birds are, as a rule, a half-starved, scraggy lot. Half the number well fed and sent to market at the right age would have given a good profit and full satisfaction to the purchaser. It is doubtful if these half-starved, inferior birds paid for the little feed they received.

When is a Hen too Old to keep?

This question is frequently asked, and the conventional reply is: "After her second season." However, individual hens vary, and many cases are on record of good laying results at four, and even five, years. Special hens may be kept until the fourth year for breeding purposes, if they are vigorous.

Agricultural Bureau Conferences.

The Annual Conference of the Northern Branches of the Agricultural Bureau, held on February 3, was a very successful gathering. There was a good attendance of Bureau members and others, and the papers read were well discussed. The South-Eastern Conference has been postponed until April 5; the Southern Conference is to be held at Strathalbyn on March 30; while it is proposed to hold a Conference of the Lower Northern Branches at Gawler during March.

Rabbit Destruction.

Recent decisions of the Supreme Court have directed special attention to the unsatisfactory condition of the Vermin Destruction Acts, rendering inoperative all attempts on the part of the local governing bodies to compel landowners to destroy the rabbits on their land. At its February meeting the Council of Agriculture passed a resolution urging the necessity for fresh legislation on the subject, and the Hon. Minister of Agriculture has since intimated that a consolidating Act will be introduced during the next session of Parliament. If landowners and others with practical experience of the defects of the present law will indicate to the Department of Agriculture wherein amendments are necessary their suggestions will receive careful consideration.

PRINCIPLES INVOLVED IN THE IMPROVEMENT OF A HERD, EITHER FOR BEEF OR MILK.

By WILLIAM ANGUS, B.Sc.

Perhaps the finest asset which our forefathers bequeathed to agriculture is to be found in those pure breeds of stock, those horses, cattle, sheep, etc., in repute alike for their beauty of form, their usefulness, and their power of reproduction. With the object of producing a fixed type, such animals have been bred for many generations on direct lines by men who, in their aim and in the maturing of that aim, employed such scientific methods as to succeed in getting "like to produce like." No grander legacy has been left the present-day farmer than the work

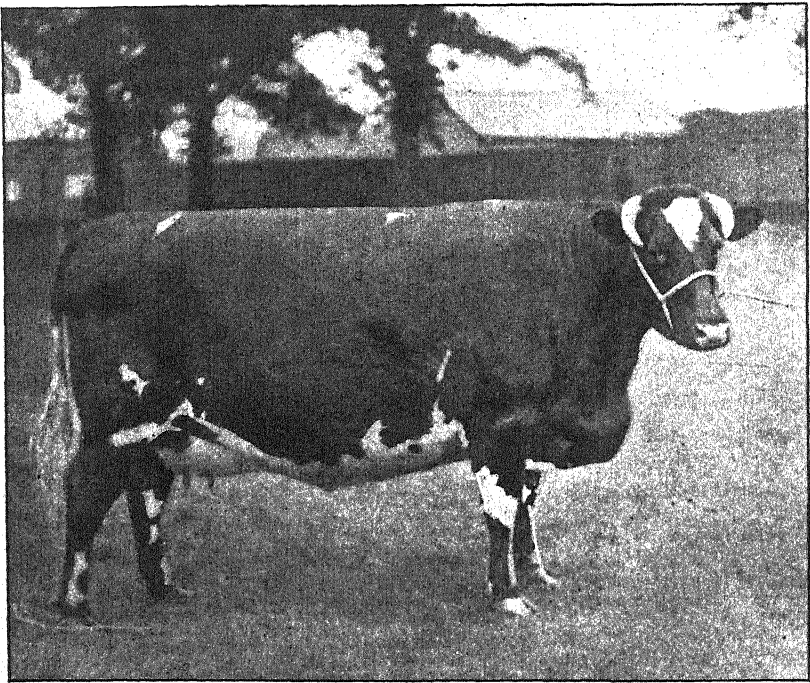


Fig. 1.—One of the Right Sort.

of those pioneers in breeding, and if the stability of agriculture is to be maintained still greater attention and more encouragement must be given to the improvement of our farm stock.

The raising of pure strains is a department of agricultural practice which is affording great inducement to the expert. On every hand we find that, where animals have been reared possessing sound constitution and the power of breeding to type, competition for such is very keen, and high prices are being realised. As an example of this, I need only

mention that in Britain this season has been a record one for prices—the Argentine Government carrying off in open competition perhaps the finest Shorthorn bull in the old country at the fine price of £1,500, while the other day the Scottish-bred bull Newton Stone changed hands in Buenos Ayres at the still higher figure of £2,610. This price, however, has since been eclipsed in Argentina by the Durham bull Pat realising the sensational figure of £3,250.

In Australia much good work has already been done in the breeding of pure strains of cattle. This work, however, is largely confined to the few, and, although the benefits of those herds are being felt all over the State in the gradual improvement of ordinary crossbreds, still the farmer is doing far too little in this direction. In many cases he is

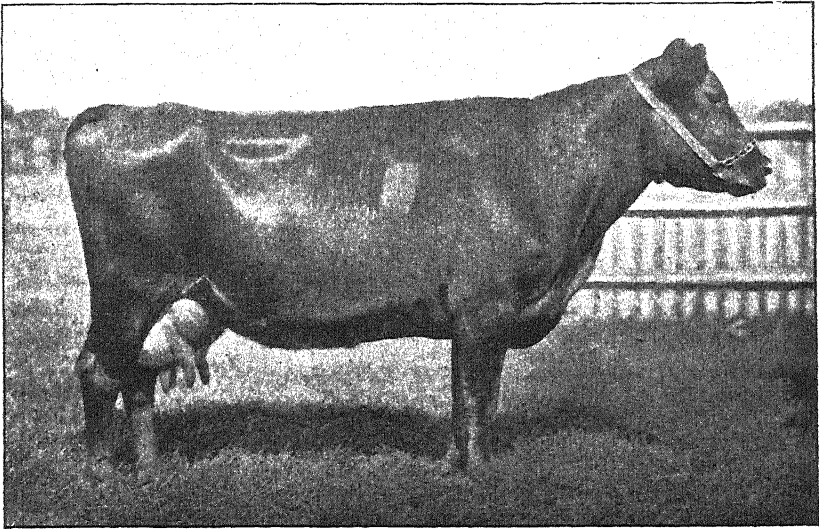


Fig. 2.—A Common Type (Faulty).

satisfied with a very ordinary cow, but more often with any sort of bull, and, under such conditions, nothing but deterioration of stock can follow.

PRINCIPLES OF BREEDING.

In farm stock, as with other animals, there are certain broad principles on the lines of which all successful breeding must proceed. The first of these, and a very important one, is what is known as the "law of heredity," often expressed in the simpler form, "like begets like." In the case of the human animal, the same principle is borne out in the expression, "like father, like son." Now, although the law of heredity applies in the main, it does not hold good in every particular. Certainly we are assured by its working the transmission of like characters

from parent to offspring, and these will be more pronounced the more the parents agree in type. Still, we never do find animals giving exactly the characters of their parents. There is always a certain amount of "variation," due, no doubt, to the differing characters of the animals mated.

Among animals in the natural state we have in force what is known as "natural selection"—animals mating at will. With domesticated animals, however, man interferes, mating those which are most likely to produce the type which he desires. When a variation appears which he thinks would improve the strain, he sets about fixing that in the type by what is known as close-breeding. Hence, we have at work in the process of breeding the three laws of heredity, variation, and selection.

Heredity is found to be strongest in old and established pure breeds. The reason of this is that for many generations there has been gone through this process of fixing a type, and animals have been got with the tendency to breed in this direction.

Applying these principles we find:—

1. That if we mate good animals we have a certain guarantee that they will produce good stock or offspring, not varying much from themselves.
2. That variations that are improvements on the individual may become fixed by close-breeding.
3. That in every case the power of selection can be exercised, and in this lies the great means of improvement.

Influence of the Bull.—In practice it is found that the potency of the bull is greater than that of the cow. He is held to contribute especially to the external form; the female more to the vital or internal organs. This being so, we can see how important it is, more especially for the production of beef, to use none but the best of bulls; and these facts also explain why the demand for first-class bulls is so great in countries raising "stores." Of course, there is another reason why one should be careful in the selection of a sire, in that his characters are transmitted to a greater number.

The Americans have thoroughly recognised these principles in the improvement of their cattle, and within the last ten years the Irish Department of Agriculture has done much to improve the store cattle, which are sent over to England, by the use of bulls bought from the best herds in Britain. This points to the fact that the ordinary farmer must proceed on these very lines, and make it his first rule to have a good bull.

But, further, if it be true that "the influence of the first male by which a female produces young may frequently influence her offspring

by different sires," then the quality of the sire becomes a most important matter. As to the truth of this theory of telegony I am not prepared to make any statement further than this: that, although there appears to be a deal of evidence in favour of its acceptance, yet the latest pronouncement by one who has given it most careful study is that there is nothing in it.

Again, with regard to the bull, it has been borne out in practice that, as a rule, a well-bred animal, though somewhat plain, with nothing very striking about him, will often breed better stock than a good-looking, badly-bred animal. The explanation of this is that in the case of the pure-bred animal a type has been fixed, and he will tend to breed to that type; not so in the case of the other.

THE COW.

In selecting cows from which to raise stock, it should be borne in mind that there is a very marked difference in type between the beef animal and the dairy cow.

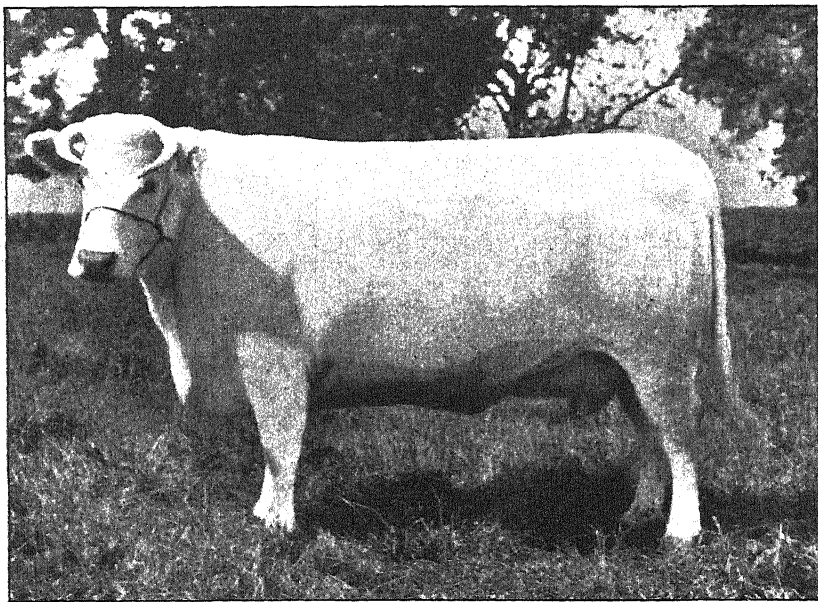


Fig. 3.—Perfection in Beef Type.

Taking the animal in Fig. 3 as typical of the beef class—and we must admit she is a good specimen—one recognises the symmetry of form, the straight back, the shoulder well set and nicely filled behind with flesh, the chest deep and wide, with prominent dewlap. She is a compact, well-covered animal, straight above and below, and with very little appearance of udder or milk veins.

Here, on the other hand, in Fig. 4, we have quite a different animal, one whose every feature indicates the power to yield a large flow of milk. This animal took many prizes at Dairy Shows in the old country, her record yield being over 1,600 gallons per annum. As compared with the cow in Fig. 3 she is more angular in form, finer about the shoulder, less fleshy, and having a large and capacious udder, extending well forward, with well-developed milk veins. For a Shorthorn

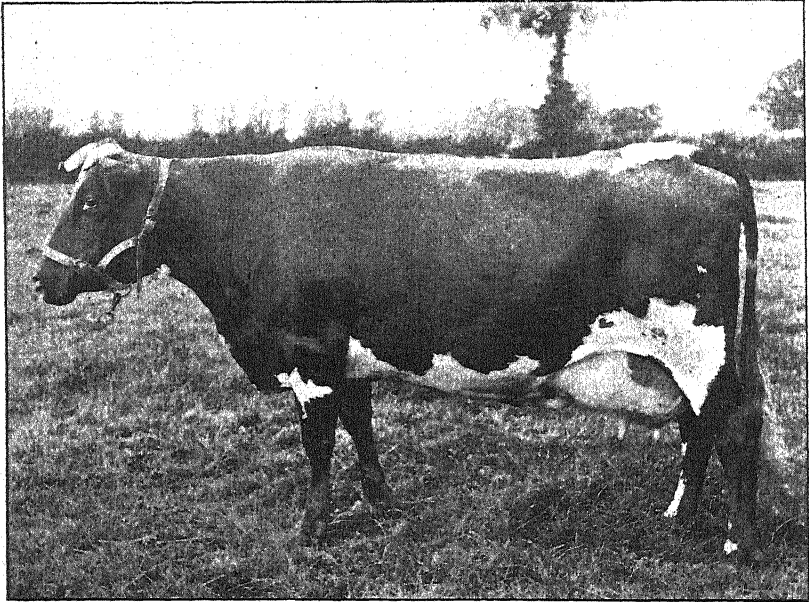


Fig. 4.—The Milking Shorthorn.

milker one could hardly wish for a finer specimen, her bag and milk veins being all but perfection.

But perhaps to South Australians the animal in Fig. 5 will appeal more strongly, as embodying the ideals of a dairy cow. It is worth mention, too, that in no other strain of cattle has the power of breeding to type been so strongly fixed as with Jerseys. By careful selection of bulls descended from the best milking dams, and by attention to the feeding and rearing of their calves, they have produced a breed with extraordinary uniformity of type, combined with the power of yielding milk rich in butter fat—probably the finest dairy animal for butter production.

Dual-purpose Cow.—There is another class of cow about which we have been hearing a good deal of late in Australia—the dual-purpose

animal. The meaning of the term is evident—an animal that will give a good supply of milk and also be of sufficient quality to be easily and speedily fed off for beef. According to some authorities, especially in America, no such animal exists. It is interesting, however, to find that several specimens of this particular type have recently been imported by the Queensland Government from the famous herd of John Evans, of Burton.

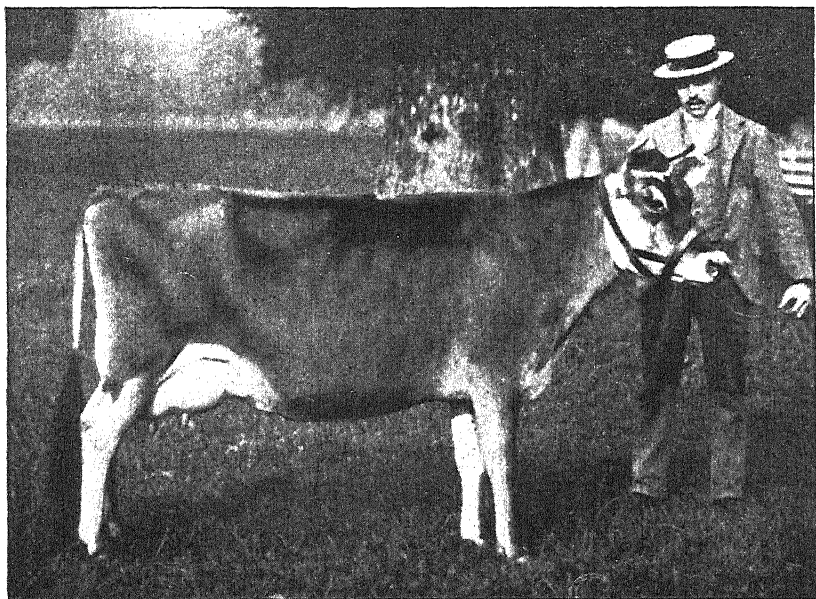


Fig. 5.—The Jersey (a Splendid Udder).

This gentleman, who, up to about twenty years ago, had been a successful breeder of beef cattle, determined to convert his herd of Red Shorthorns or Lincoln Reds, as they are called, into “dual-purpose” animals. He began with the idea of producing quality with milk, and he has succeeded in proving that by careful selection of bulls—which, by the way, he considers more than half the herd—by judicious mating of animals, and by weeding out those cows that do not come up to a standard yield of milk, it is possible to combine the two.

The following figures, taken from his yearly milk register, will form interesting reading:—

AVERAGE YIELD OF COWS.

Taking his yields from 1890, three years after he commenced his experiment—

31	cows	calving	during	1890	averaged	740	gallons
35	"	"	"	1891	"	720	"
34	"	"	"	1892	"	795	"
38	"	"	"	1893	"	732	"
39	"	"	"	1894	"	834	"
43	"	"	"	1895	"	867	"
42	"	"	"	1896	"	879	"
36	"	"	"	1897	"	881	"
38	"	"	"	1898	"	824	"
34	"	"	"	1899	"	860	"
36	"	"	"	1900	"	795	"

Such a record is one to be justly proud of, and it will be interesting to follow the representatives of this herd under their new conditions in Queensland.

(To be continued.)

ANTHRAX.

In view of the reported outbreaks of anthrax in several of the Australian States during the past year or two, the following report, made to the Tasmanian Department of Agriculture by Dr. R. Willmot, Government Veterinary Surgeon in that State, is re-published from *The Launceston Examiner*:—"I have the honour to inform you that I forwarded the bacteriological preparations which enabled me to decide that the outbreak of cattle disease near Burnie was anthrax, to Mr. Desmond, the Government Bacteriologist and Veterinary Surgeon for South Australia, for the expression of an opinion on the subject. Mr. Desmond's reply has been made an official matter by his Government, and has been forwarded to you direct from the Hon. the Premier of South Australia, but during your absence the reply was sent to me from the office of the Hon. the Premier of this State. The report reads as follows:—"From the history of the case, the preparation of the slides, and a microscopical examination I have no hesitation in pronouncing the case to be anthrax." It is a matter of regret that a certain section of the public have so little confidence in the opinions given by the experts in this State, and that confirmation of such opinions from experts outside is considered necessary. This independent opinion of Mr. Desmond should, however, set the matter at rest, as that gentleman lives in another State, is personally unknown to me, is recognised not only as one of our most able bacteriologists, but also holds the highest repute as a veterinary surgeon. I may also say, *en passant*, that Dr. Roberts, the State Bacteriologist, has inspected the preparations made by me both in the Burnie case and another that has since occurred, and confirms my opinion in both cases. Whilst on the subject of public dissent to expert opinion, I beg again to bring to your notice the desirability of enforcing official registration of veterinary practitioners. This is especially necessary in the interest of stockowners, to enable them by reference to judge of the value of opinions

given on veterinary and bacteriological questions by persons who, without holding any authorised authority to do so, style themselves veterinary surgeons in this State. This proceeding need neither press hardly on any unqualified persons now practising, or interfere in any way with their undoubted usefulness in certain departments of veterinary medicine, but will tend to the introduction into the State of really qualified and competent men, in place of the now existing quack cow leech. The system is established in Victoria, with much benefit, and without hardship to any one, and is advocated by the heads of all the veterinary departments in the Commonwealth States and in New Zealand."

POULTRY IN FREE RANGE *v.* CONFINEMENT.

By D. F. LAURIE.

The above is a subject upon which many and diverse opinions have been expressed. The matter cannot be settled in a few words, because many things have to be considered, and what may suit one case may not be suitable in others. Birds in confinement must, if they are to prosper, have all that they would naturally obtain on a free range of the best description. It may be briefly stated that taking the whole year there are few parts of South Australia where a natural free range can be considered as approaching the ideal. On large extents of barren, weather-swept country poultry would be at a distinct disadvantage, and in such cases range or freedom would be of questionable benefit. There are many favoured localities, such as orchards and orangeries, where no bush or soft fruits are grown, which are admirably suited for poultry, as will be seen later on. The benefits derivable from free range are exercise and a greater or less supply of grit and natural food, such as insects and miscellaneous seeds and vegetable food. Exercise in this case may consist of running about after insects, winged and others, and in scratching among debris for various items agreeable to the poultry palate. From a sanitary point of view, on a free range there is scarcely any danger of contamination through the excreta. In suitable country the birds may pick up a great part of their living, and so materially reduce the cost of their keep. This is attractive to many, but when the case for the other side is stated it will be seen that there are other considerations. Insect life is not plentiful in many portions of the State, and yet poultry may be kept with profit in such localities. Poultry may be kept on scrub country of such a nature that there is very little vegetation which they can eat. While they may do fairly well under such circumstances they will do better under more favourable conditions.

Having put the case plainly for free range under general conditions, a few words may be spared for describing special conditions. These are generally in the favoured portions, where the rainfall is abun-

dant, and grass and herbage green throughout the summer. It may be observed, however, that where such is the case the winters are generally cold and wet, and at that season the birds in a free range are at a disadvantage. There are numerous cases throughout the country where the birds have the free run of the homestead, and in many instances there are fruit and vegetable gardens attached, wherein the birds find much food. They often, however, do much damage, which in a measure may counteract the good they do in destroying noxious insects.

There is no doubt, and numerous experiments have been made in ascertaining this fact, that poultry in orchards, if under proper restraint, are unequalled as insect destroyers. The subject of restraint is, however, important. The vineyard owner can only allow the birds among the vines after the vintage and until the grapes begin to form, when the birds must be removed, as they will often eat the green fruit. In the orchard they are of value, and will materially decrease the number of codlin moths; they will eradicate the curculio weevil; and, if the ground is well cultivated, will soon unearth and destroy wire worms and other forms of pests. In some of the orchards in Victoria paper bandages are placed around the trunks of apple and pear trees to afford shelter to codlin moth caterpillars. The fowls have been seen to pierce the paper with the beak and extract the insects, the slight swelling caused by the grub being quite apparent to the bird. Over twenty years ago the late Mr. William Cook, the well-known English writer, described one of his ventures. Briefly, he secured a piece of land on which a large number of old, non-fruited apple and cherry trees managed to exist. He built a number of poultry houses and stocked the ground heavily. When all the grass was eaten and a fair accumulation of poultry manure was available, in addition to that already dropped on the land, the whole area was ploughed, the birds still remaining for a time. It occurred to Mr. Cook to attempt some renovation of the trees, with the main view of inducing growth to provide shelter. Later on the flock of birds was reduced in size, and in the course of a few seasons the trees improved, and in time bore heavy, profitable crops, the land thus serving two purposes. Three years ago I planted a number of fruit trees, including some of the citrus tribe. The curculio beetle, which is numerous in this district, soon began their unpleasant attentions, eating the leaves of the young trees. I kept the ground cultivated, and introduced a flock of vigorous chickens. The beetle is rare now.

Restrictions must be placed on birds running among fruit trees. The flying, or lighter, breeds are not suitable, as they will fly out of any yards to regain the garden they were accustomed to, and, besides, they may fly into the fruit trees and spoil the fruit. Orpingtons, Wyandottes, Langshans, and Plymouth Rocks are suitable breeds under such circumstances. Too many birds must not, however, be kept in small fruit gardens, especially while the trees are small, for if there is not an abun-

dant daily supply of green food they will soon deplete all the foliage within reach.

I have, I think, treated free range fairly, but must mention a few of the evils which are constantly witnessed. Around the homestead or country house the birds may work much havoc; haystacks are damaged; growing wheat and other grain crops are partially destroyed; the nice patch of mangolds destined for the cows and pigs are all neatly hollowed out; the flower garden is a picture of desolation and dust baths; and, in many cases, the birds will congregate around the back door, the approaches to which are soon rendered in an insanitary condition. Then when free range is carried out in a manner characteristic of many of our country friends, the birds have a cosy roosting-place out on the stripper, winnower, etc., and, should these be housed in a shed, there will often be quite a considerable accumulation of manure by harvest time. Under such conditions, the fowls, if not attended to, become infested with vermin, and these extend to the woodwork, and keep the unfortunate horses in the stables in a lively condition at night.

Birds in Confinement or Under Control.—Given the proper breeds of poultry, the profits to be derived depend on proper management. Even if the stock birds are good, it does not follow that every one of their progeny will also be desirable, and to ascertain this the breeder must be enabled to make frequent and close scrutiny of each bird. One fowl is not as good as another as a matter of course; there are good and indifferent in every breed. Only the profitable birds should be retained; the birds must keep the breeder, not *vice versa*. The free range fowl steals her nest, and her owner may not see her every day, consequently he cannot say whether she lays or not, or whether she is eating her own eggs and those of other hens. The hen under proper conditions has a regular nesting place wherein she lays; it is known how many hens there are in each enclosure; they are to be seen at feeding times; and, if the egg yield is unsatisfactory, an investigation can be made. Out of 100 free-range hens half may be fair layers, a few may be good, and the rest worthless, and yet they are suffered to occupy the space and eat the food which would suffice for an equal number of profitable birds. No one can afford to run poultry by guesswork. Many of the undoubted advantages of free range may be artificially supplied to poultry in modified confinement.

Many years' experience teaches me that the lazy man's ideal of unlimited but food-barren range may certainly permit the birds to exist on a small amount of purchased food, but there is no profit; generally there is much loss. The question of over-stocking is better understood now than formerly. It appears certain that a given area of soil will only absorb and deodorise a given amount of excreta, and still remain quite healthy for the stock living thereon. This amount varies very considerably with the nature of the soil and climatic conditions. Excreta-saturated soil appears to give off exhalations which are poisonous

in their effect on the stock. It is considered that no bird or animal can permanently thrive if constantly exposed to the influence of the excreta of its kind. Again, we find that such excreta-saturated soil is a fertile breeding-ground for many organisms which cause poultry diseases. Whether the area be large or small, according to conditions there must arrive a time when the soil is saturated to danger point, or becomes, as it is termed, "sick."

The extent to which a given area of land may be stocked depends:—

1. On the nature of the soil, allowing a safe margin, which can only be ascertained by observation; that is, experience.
2. On the amount of work which is done in digging over and otherwise decomposing the manure naturally or by the help of lime and ashes; or by cropping the runs alternately, which is in every way very satisfactory. By resting and cropping each yard in turn—which practice presents no difficulties except on stony ground—a larger number of birds can be kept on a given area and to better advantage than a much smaller number where the soil is left unbroken.

For egg production, as well as for table bird breeding, the general consensus of opinion favours rational confinement of the birds. Where space is ample, large runs connected with the smaller enclosures should be provided; in these the birds may run when desired. In orchards portable houses and division hurdles may be used, as necessary, to thoroughly control the birds. The orchards and large runs generally are more suitable for growing stock, breeding stock out of season, or for change of run for birds during the moult. In respect to egg producing, the small yards, with scratching sheds for use during inclement weather, and the provision of grit, green, and other suitable foods, with constant attention to the soil and to cleanliness, will give the best results. The advantages are that the owner has the birds under complete control; the proper amount of food can be determined; the condition and productiveness of each bird can be ascertained; each bird may be kept at the highest degree of profit; disease may be warded off; egg and feather eaters may be dealt with; the eggs are gathered at frequent intervals, and marketed in the best condition. True, every item of food has to be provided, but it is the right kind of food for the purpose in view, that is, egg production. A laying hen is much in the nature of a machine—to yield a profit she must be well housed and well fed. There should be no sign of vermin in a properly conducted hennery. A scratching shed, 20 by 10 feet, will, if floored with a few inches of wheat chaff on which grain is scattered, afford healthy exercise and promote health and condition on the birds such as is seldom attained on a free range, and, moreover, the egg yield is large and assured. This applies especially during autumn and winter, when eggs are scarce and commanding high prices; and in the hot weather, if shade-giving shrubs are grown in each yard, the birds will be more comfortable than when at large, except under conditions so favorable as to be uncommon.

Table birds of prime quality cannot be produced except by the controlled system: birds running at large are not fit for market. When they reach the proper age the birds at large should be graded and penned in smaller yards, where they can be carefully fed, and made ready for sale at the earliest period.

There are a great many losses every year, due to the ravages of domestic cats, tame or wild, and the native cats: also rats and hawks, while the wily crow is a great egg thief. The fox is gradually drawing in the net, and is shortly to be reckoned as a great curse. Where the birds are enclosed in substantial yards, and have proper houses proof against enemies, the majority of these losses will be prevented.

CATTLE COMPLAINT.

The following extracts from a report by Veterinary Surgeon Desmond on losses of cattle from disease in Myponga district are published for general information:—

"I visited Myponga district on February 9, and on the following day enquired into deaths of cattle, eliciting the following information:—

"Mr. Jonathan Eats keeps about 50 head of cattle, and his losses from disease known locally as 'dry bible' have averaged about three head every year. This year already he has lost three adult cattle and three calves, the first case of which occurred about a month ago. Several had died previous to my visit, and the others I had to destroy, as they could not get up. One, a bull, was seen eating rabbits that were killed by phosphorus, and he showed symptoms of poisoning. The symptoms shown by the affected cows were as follows:—Dribbling from the mouth, and stiff all over. On the morning of February 9 Mr. Eats drenched the cows with Epsom salt, gentian, ginger, and treacle, in a quart of hot water, as recommended by the Chief Inspector of Stock.

"On the 10th all the cows were yarded for examination. No. 1, six years old, was noticed to be stiff on the 8th. She was in poor condition; hair rough; spine slightly arched when standing: was not ruminating. No. 2, also six years old, fair condition, but depressed look about the head, dribbling from nose: has tucked-up appearance. She had purged from the medicine given on the 9th. No. 3, seven-year-old cow, in good condition; standing with feet extended: great difficulty was experienced in giving her the medicine on the 9th. No. 4, four-year-old cow, poor in condition; coat rough; has a dejected look. Medicine given on 9th caused purging. Poisoning rabbits with phosphorus has been extensively carried on on this farm, and I am of opinion that the majority of the losses can be attributed to the animals eating the poisoned rabbits.

"Mr. A. A. Eats had two cows affected. One was three years old, in fair condition, but had been stiff in the legs for nearly eighteen

months. No. 2 was eight years old, in fair condition, but affected for past three months the same as No. 1. These cattle require a supply of bone-forming material, and the owner was advised to provide a lick of salt, sweet bonemeal, and sulphate of iron.

Mr. J. Rowley had one three-year-old cow, in fair condition, which had been bad for fourteen days, the main symptom being stiffness in the legs. She had received 18 oz. Epsom salts in two doses. The owner had noticed her eating the dried carcasses of rabbits which had been poisoned. This indicates that the cattle require a supply of bone-forming food.

Mr. Thomas Eats has lost 20 head during the past year, and has two bad now. These were being treated with a proprietary medicine, and were not submitted to physical examination.

Mr. J. Rogers has lost several head of cattle, and one cow was bad. She was six years old, in fair condition, and had been drenched with Epsom salts, gentian, etc., on February 7. This was a genuine case of epizootic paralysis (commonly called 'dry bible'), and presented the following conditions:—Lying down in a natural condition, not showing symptoms of pain: tongue hanging out for a distance of six inches, and quite dry and hard. An attempt was made to drench this cow with water. This distressed her very much, although only a few spoonfuls were given. After receiving the water she got up with difficulty, and had violent trembling of all the muscles of the body, and symptoms of agonising pain, then throwing herself on the ground. When the tongue is protruding, and dry paralysis of the tongue and throat has set in, the affected animals are not able to swallow, and when

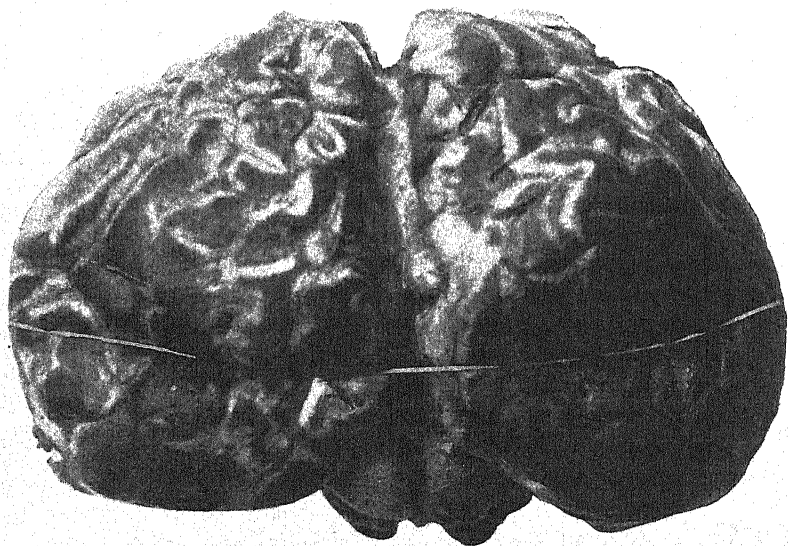


Fig. 1.—Brain of Cow, with Congestion of Blood Vessels and Membranes.

fluids are poured into the mouth with the head raised they run down the windpipe, producing suffocation. As this cow was *in extremis*, the owner requested me to destroy her and make a *post-mortem* examination. She was bled to death by quickly severing the head from the body, and the brain was examined at once. It was found to have extensive congestion of the blood vessels and the delicate membranes forming its covering, and was removed for further studies. (See Fig. 1.) The body contained a fair amount of fat, in which numerous punctiform hemorrhages were found. The muscles also were found to contain a large number of punctiform hemorrhages. The digestive organs were next examined. The rectum and posterior portion of the bowels contained normal ingesta, while the small intestines contained an excess of bile and semi-fluid ingesta. The duodenum and fourth stomach were critically examined, and presented a good field for study. The duodenum showed inflammation of the inner coats. The fourth stomach contained rabbits' dung, stones, wire nails, tacks from well-worn boots, while on the inner coats well-marked ulcers were found. (See Fig. 2.)



Fig. 2.—Photograph of Inner Coat of False Stomach of Cow. Ulcerations shown at end of lines.

The third stomach did not contain ingesta of a very dry nature, and could not be classed as a 'dry bible': in fact, its contents were of a normal condition, and not as dry as those found in many animals in perfect health that are slaughtered for the food supply. The inner coats of this stomach were in a healthy condition. In cases of 'dry bible' the third stomach and its contents are as hard as wood. When this condition is found by the owner he is satisfied that it is the *cause* of the trouble, whereas the dryness of the contents of the third stomach is the *effect* of a cause that is, so far, unknown. Blood from a large vessel of this stomach was secured to make cultivations, to see if it contained a specific micro-organism. The second and first stomachs were found in a healthy condition. The liver contained hydatid cysts, otherwise it was healthy. The gall bladder was distended with bile, whereas in cases of 'dry bible' it is, as a rule, enormously distended with bile. The lungs contained numerous small cysts: they were normal in colour, and did not show signs of any other disease. The heart was not diseased, although its walls were weak and flabby, a condition not uncommon in cattle kept in domestication. The ribs on the inner surface, at their junction with the breastbone, contained a large number of punctiform hemorrhages, a condition that is of much interest now that this disease is to be investigated with an object of finding what is the cause.

"At this stage I am of the opinion that we shall have to seek for other causes than the dryness of the herbage as the *cause* of 'dry bible' in our dairy herds. The administration of powerful purgatives to animals that have paralysis of their digestive organs is not to be commended, and in many cases it hastens the death of the affected animals."

WOOL-CLASSING AT THE AGRICULTURAL COLLEGE.

NOTES FROM THE EXAMINATION PAPERS.

By G. JEFFREY.

Most of the readers of *The Journal* are interested in our Agricultural College, where many important and useful subjects are taught. There is a class for instruction in sheep and wool, in which the students are given practical lessons with the sheep as well as with the wool, and not the least important lesson is the trip to the wool showrooms at Port Adelaide once a year. At the close of the term an examination is held in practice as well as in theory, and I was so well pleased with many of the answers to the questions at the last examination that I thought it advisable to give outsiders an idea of the intelligence of the boys referred to. I cannot pretend to give all the answers to the different questions, nor will I attempt to put them in the words of the students, but the following will give a true digest of the answers. One question was:—"What were your general impressions on visiting the showrooms at Port

Adelaide?" "The great importance of the wool industry," said one: "I had no idea until visiting the Port that the industry is so vast as it really is." The amount of pains taken by the brokers to show the wool to the best advantage, with the careful and systematic classing of some of the clips which had been classed by the School of Mines students, was what took the eye of other lads. The careless or negligent way in which some of the farmers had packed their wool was not unnoticed by some, while the bad bale-filling wool of some of our large stations attracted others.

Dealing with the question of the different factors in the development of the fat lamb industry, the improved facilities for freezing and shipping lambs were noted, while the fact that farmers were able to get a quick and substantial return for their outlay has not escaped notice. The important bearing of the increased production of grass after the cereal crops that have been manured with phosphates was not lost sight of by one of the students. Another question relating to the best methods of making fat lamb raising a success brought forward such answers as:—"In a general way farmers raising fat lambs for market should not breed their own ewes, but should purchase from the large station owners." Although the kind of ewe to be kept for this purpose would be regulated by the locality where they were depastured, in a general way the big-framed Merino ewe was recommended. It was also advocated that unless under abnormal conditions farmers should get rid of the year's crop of lambs about the same time, selling the fats to the freezers, and the culls, if necessary, to the local butcher. The kind of rams advocated varied, some going for the Shropshire, others for the South Down, the Dorset-Horn, and the Leicester.

The question relating to the benefits derived from systematic wool-classing and the best methods to be adopted brought such answers as:—"In the light of recent experience, it seems ridiculous for farmers not to class their clips." Great care, however, must be taken not to over-class. With the small farmer's clip light skirting was advised, and only keeping out the very worst of the fleeces, while with a bigger clip more subdivisions were necessary. The reason for advocating less subdivision in the smaller clips was that large and important buyers had not the time to bother with small lots, and the dividing of a farmer's clip into several classes would mean making parcels of under four bales, which would bring them under the heading of star lots. These lots are sold after the bulk wool has been disposed of, and do not meet with the same amount of competition as the larger lines.

I think this will be of interest to the readers, and it will give them a fair idea of the kind of work carried on at the College.

REPORT ON THE 1904-05 HARVEST AT THE ROSE-WORTHY AGRICULTURAL COLLEGE FARM.

By ARTHUR J. PERKINS.

(Continued from page 388.)

NOTTLE'S.

Past History.—This field forms part of the new farm, and was purchased for the College in 1898. The eastern portion had been fallowed in the preceding year, and was put under wheat in the year of purchase. In 1899 the whole of the field was sown to wheat and oats. In 1900 Nottle's was worked as a bare fallow, and in 1901 it was under wheat. None of the crops hitherto reaped from this field had proved satisfactory, and in 1902, on Professor Towar's arrival, I recommended him to leave it out of cultivation for a year, and to graze it. Grass in 1902 was poor, and the paddock was again broken up in 1903: with the exception of a sandy patch, which was sown to pie-melons, and 17 acres in the north-eastern corner sown with rape, the whole was worked as bare fallow. The pie-melons yielded a fair crop, whilst the rape was a complete failure. It is worth while noting here that, so far as the conditions of this and similar districts are concerned, rape can in no sense be looked upon as a suitable fallow crop. The springs are, for the most part, too dry to permit of satisfactory growth, and, in addition, however meagre the crop, it always effectively interferes with the surface tillage, so essential to the preparation of a suitable seedbed for the succeeding cereal. On the other hand, itself somewhat indifferent as to tillage, and, like mustard, essentially a winter grower, there exists perhaps no more useful catch crop than rape, to be taken off between harvest and fallowing time. In an ordinary rotation, however, it cannot compare with kale.

The wheat grown on the portion of the field that had been under rape in 1903 was much inferior to that grown on the bulk of the field that had been simply bare fallowed.

Like Ebsary's A, Nottle's was, in 1904, used as a test of various varieties of wheat. All varieties alike were dressed with about 1 cwt. of superphosphate to the acre, and of seed from 80 to 85 lb. were sown.

Seeding operations extended from April 15 to May 10. With the exception of portion of Plot 27, which was sown dry, between April 15 and 20, the condition of the soil was all that could be desired for seeding purposes. As has already been pointed out, $1\frac{1}{4}$ in. of rain fell on April 20, to be followed at short intervals by auspicious showers in May. Germination was throughout very satisfactory, and the paddock lying warmer and drier than Ebsary's A, winter and early spring growth was at all times more forward than in the latter field. In parts the wheat showed somewhat weedy, and it was run over with a light implement imported by Professor Towar, and known as "the weeder."

The work done was fairly satisfactory on light, free land, wherever the weeds had not made too much headway.

With the exception of varieties the seed of which had been purchased, viz., Silver King, Phillis Marvel, and Marshall's No. 3, none were pickled before seeding. To this omission I think may be attributed a somewhat serious attack of "*flag smut*" or "*black rust*," as it is better known amongst us, from which some varieties suffered rather badly. This disease appeared to have taken a firmer hold of Gluyas than of any other variety, and I roughly estimated at the time that fully one-fifth of the plants had been destroyed by it, with the result that the yield of this variety was materially reduced by it.

I append below, in Table III., details and yields of the various plots:—

TABLE III.

Showing Details of Yields of Various Plots in Nottle's in 1904.

Plots.	Varieties.	Area.	Total Produce per Acre.	Grain per Acre.	Straw to 60 lbs. of Grain.	Grain to 100 lbs. of Straw.
		acres.	lbs.	bushels.	lbs.	lbs.
1	King's Early	17.86	2,923	15.16	193	31
2	Gluyas	10.57	3,441	19.47	177	34
3	Mixture of Early Wheats		Cut	for	Hay.	
4	King's Early	48.00	4,209	22.58	186	32
5	Gluyas	21.47	4,459	24.24	183	33
6	Silver King	4.83	4,694	23.24	202	30
7	Fan	10.14	3,881	18.84	206	29
8	Cububekar (Russian) ...	0.54	2,500	12.65	198	30
9	Pyeckar (Russian) ...	0.54	1,852	6.11	303	20
10	Smart's Pioneer	1.69	4,290	13.90	309	19
11	Warwick	2.87	4,753 (?)	16.88	282	21
12	Jerkin	2.71	6,801 (?)	19.70	350	17
13	Fan	1.50	4,820	16.68	289	21
14	King's Early	2.73	4,658	18.26	255	24
15	Early Purple Straw ...		Cut	for	Hay.	
16	Marshall's No. 3... ..	1.70	3,635	21.16	172	35
17	Leak's Rust-proof ...	1.70	5,226(?)	13.78	394	16
18	Defiance	2.63	3,570	13.12	272	22
19	Galland's Hybrid ...	1.67	3,013	9.56	315	19
20	King's Early	2.66	3,445	16.48	209	29
21	Dart's Imperial	1.67	4,221	11.28	374	16
22	Bearded Innominate ...	2.47	2,401	14.99	160	37
23	Silver King	1.59	5,650	23.29	242	25
24	Marshall's No. 3... ..	1.69	5,491	22.20	247	24
25	Phillis Marvel	1.69	6,509	21.14	308	19
26	King's Early	1.69	6,038	26.62	226	26
27	Majestic	9.70	3,690	17.35	213	28
28	Majestic (broadcast) ...		Cut	for	Hay.	
	Totals for Field ...	156.387	4,077	20.01	204	29

At the outset it should be premised that this field, because of its extreme patchiness, is singularly ill adapted to the purposes for which it was sown, viz., the testing of different varieties of wheat one with the other. We find in it the light, dusty limestone soil so characteristic

of our mallee country, pine ridge sand, loams, and heavy soils of various descriptions. This irregularity in texture, and consequently in natural fertility, is well illustrated in the varying yields of the several plots of King's Early scattered over the field. They are summarised below, in Table IV.:—

TABLE IV.

Showing Yields from King's Early, on Different Plots.

Number of Plot.	Total Produce per Acre.	Grain per Acre.
	lbs.	bushels.
1	2,923	15·16
4	4,209	22·58
14	4,658	18·26
20	3,445	16·48
26	6,038	26·62

Thus, for King's Early in the same field the yields varied from about $1\frac{1}{2}$ tons of total produce and 15 bushels to the acre to $2\frac{3}{4}$ tons of total produce and nearly 27 bushels to the acre. Concerning this well-known variety of wheat, there is little to be added to what has from year to year been said of it in the College reports. Its perfect adaptability to Roseworthy conditions, particularly on the lighter class of land, has now been demonstrated for years, and it is pleasing to note that on one plot at least it heads the averages for the year. It is not rustproof, but with us it has always ripened its grain sufficiently early to escape any distinct pinching, and this was again the case in the present season. I am bound, however, to repeat that this variety appears to me to have degenerated somewhat in its yielding capabilities, and that this falling off may be attributed to the long use of the same seed without the adoption of any systematic form of selection. I propose in the future endeavouring to remedy this defect.

In Nottle's, as in Ebsary's A, the yield of Gluyas was very satisfactory, and this notwithstanding a bad attack of flag smut already referred to; in fact, Plots 2 and 5 of Gluyas yielded respectively better than Plots 1 and 4 of King's Early, to which they were contiguous. There was not a sign of rust on this wheat, and the sample of grain secured was of very high quality. I have no hesitation in classing this wheat as one of the best for grain under our conditions.

In this field there were two plots of Silver King, viz., Plots 6 and 23, both of which returned approximately equal yields of grain, but very different yields of total produce. Thus, whilst in Plot 6 there were 30 lb. of grain for every 100 lb. of straw, there were only 25 in Plot 23. I must here repeat that this variety appears to have excellent yielding qualities, but that under our conditions it is far too susceptible to red rust to render advisable its general use. I noticed, too, a rather marked tendency to unevenness in ripening off the grain.

The two plots of Fan, 7 and 13, were to us exceedingly disap-

pointing. They yielded far less than we had anticipated, mainly, I fear, owing to a greater susceptibility to rust than we had suspected.

The two Russian wheats, Cububekar and Pyeckar, were secured by the Agent-General at the instance of the late Mr. F. E. H. W. Krichauff. They were first sown at the College in 1903, and the grain secured sown again at Nottle's in 1904. The seed sent out was exceedingly impure. Before harvest, without any special difficulty, I picked out 10 to 12 distinct varieties from one and the same plot, and so general was the mixture that it was quite impossible to determine to which variety belonged the euphonious name under which the blend was received. Of the two plots the one labelled Pyeckar was an almost complete failure, and I do not propose re-sowing it. Cububekar, on the other hand, yielded far better grain than was sown or originally received, and it is quite possible that it may prove of value to us yet.

Smart's Pioneer was badly affected with rust, and the same may be said of Leak's Rustproof, Dart's Imperial, and Defiance. None of these varieties are of much value here.

Jerkin and Warwick may be said to have fairly held their own, escaping rust by relatively early maturity. Both varieties are commendable both for grain and hay in this district.

Marshall's No. 3, very popular in many districts, yielded well here this season. It is not rust proof, but the grain did not suffer from the slight traces that could be noticed here and there.

Bearded Innominate can only be described as fair. Like King's Early, and for similar reasons, it has lost somewhat its earlier yielding qualities.

Phillis Marvel, grown for the first time on the College Farm, yielded fairly well, whilst Galland's Hybrid was cut too early, the grain being completely shrivelled and the yield much reduced.

Majestic was somewhat disappointing. The standing crop had all the appearance of a heavy yield; "white heads," however, reduced it considerably below our anticipations.

It will be noted that, notwithstanding a heavier yield, the relation of straw to grain in this field remains substantially the same as in Eb-sary's A, viz., about $\frac{1}{2}$ a bushel of grain to 100 lb. of straw.

FIELD No. 5.

Past History.—In view of the ordinary forms of rotation in use in this district, viz.:—(a) 1, bare fallow; 2, wheat; or (b) 1, bare fallow; 2, wheat; 3, grazing—the past history of this paddock is not without interest. It is summarised below:—

1897	...	...	Bare fallow
1898	...	...	Wheat
1899	...	...	Wheat
1900	...	...	Bare fallow
1901	...	...	Wheat and oats
1902	...	...	Grazed
1903	...	...	Bare fallow
1904	...	...	Wheat

Thus, in four years, from 1898 to 1901, this field was three times under crop, and, speaking from memory, the crops reaped were very satisfactory. It would add to the interest were the respective yields available. Unfortunately, however, I can find no record of them.

It was in this field that were laid out the usual manure plots. Unfortunately, the record of the plots was not kept sufficiently carefully, and, as the results secured at harvest are more or less contradictory, it would serve no good purpose to publish them. I must again express the opinion that to shift manure plots from field to field can no longer help towards solving the various problems with which wheatgrowing is beset; and I propose during the incoming season establishing what I hope will prove permanent experimental plots. For it is only by constant repetition that the disturbing effect of "season" can be neutralised.

With the exception of 11·96 acres sown to King's Early, the whole of the field was in the past season under Bearded Innominate. This paddock was sown last of all, seeding extending from May 14 to 25. The crop was, therefore, later than in the other paddocks. Straw was somewhat short, but heads good. About 80 lb. of seed to the acre was sown, and over the greater portion of the area about 1 cwt. of superphosphate to the acre was used.

The 11·96 acres of King's Early yielded 128·8 bushels, or 10·77 bushels per acre, whilst the 110·39 acres of Bearded Innominate yielded 1,903·53 bushels, or 17·25 bushels per acre. Thus the yield of the whole field was 16·61 bushels to the acre, a return not at all unsatisfactory for a late crop.

TOTAL YIELD OF THE WHEAT CROP ON THE COLLEGE FARM IN 1904-05.

We are now in a position to determine what has been the total average yield of the wheat crops on the College Farm during the past season.

TABLE V.

—			Area Reaped for Grain.	Total Yield.	Yield per Acre.
			acres.	bushels.	bushels.
Ebsary's A	..	..	51·30	805·41	15·70
Nottle's ..	..	..	156·38	3,129·21	20·01
Field No. 5	..	..	122·35	2,032·33	16·61
Total area reaped for Wheat			330·03	5,966·95	18·08

In connection with this yield of 18 bushels from 330 acres, it should be noted that much of the area under crop was taken up with purely experimental plots, and varieties more or less ill adapted to our conditions. Had the same area been worked as an ordinary farm, the average yield would no doubt have been heavier.

(To be continued.)

COST OF A BUSHEL OF WHEAT ON FALLOW.

By F. COLEMAN, Saddleworth.

[At the February meeting of the Saddleworth Branch of the Agricultural Bureau, Mr. Coleman submitted the following estimate of the cost of growing wheat on fallow on his farm in 1904. Criticism on these figures is invited.—ED.]

BASIS FOR ESTIMATE.

Cost of team, six horses, with plough, etc., one man, one day:—

Feed, 2½ bags (40 lb. each) chaff, and 24 sheaves hay (7½ lb. each)	4	7
Depreciation and risk on team (value, £120), at 15 per cent.	1	3
Depreciation on plough, 10 per cent. (3-furrow)	0	6
Wear and tear on shares	0	10
Labour, one man, with board, at 27s. 6d. per week	4	7

Total cost, with plough, etc. 11 9

Cost of team, three horses, with seeddrill, per day, 9s. 2d.

Cost of team, four horses, with harvester, including depreciation, 10 per cent., 25 days, 16s. 11d.

Cost of an acre of wheat on fallow:—

Ploughing, 3-furrow, 4 acres a day, per acre ...	3	0
Scarifying twice, at 1s. 6d., 8 acres a day ...	3	0
Harrowing, twice, at 4d.	0	8
Drilling in seed and manure	1	0
Seed wheat, 1 bushel	3	4
Manure, 1 cwt. superphosphate	4	3
Rent, for two years, at 4s. 4d.	8	8
District Council rate for two years	0	4
Land tax, two years, ½d. in the £	0	4
Reaping, cleaning, and bagging, with harvester ...	2	6
Cornsacks, twine, and labour, with four-bag crop	2	6

Total cost per acre, with harvester ... £1 9 7

If stripper and winnower are used, the cost would be: For stripping, 2s. 6d.; cleaning, 5d. a bag, or 1s. 8d. an acre (four-bag crop), making total, with stripper instead of harvester, £1 11s. 3d.

Return, 1904 crop, 15 bushels 32 lb. clean wheat, at 3s. 1½d., £2 8s. 4½d.; leaving profit, with harvester, of 18s. 8½d. per acre: or, with stripper and winnower, of 17s. per acre; equal to 1s. 2d. and 1s. 1½d. per bushel profit respectively.

The above estimate is for wheat alone, and returns from stubble for grazing and value of straw and cocky chaff form, of course, part of the return. The members of the Branch generally approved the estimate as a fair one for the district. With some the item of ploughshares would be heavier; possibly rent a little less if stony ground. Mr. Frost considered value of team too low at £120, but 15 per cent. depreciation and risk of loss would meet the case probably.

DOES THE FARMER BENEFIT FROM A HIGH F.A.Q. STANDARD FOR WHEAT?

By W. L. SUMMERS.

The above question is frequently asked by the farmers of South Australia when the much-vexed subject of the standard bushel is under discussion, and as frequently is answered in the affirmative by the members of the Corn Trade Section of the Chamber of Commerce. While it is, no doubt, true that many of our farmers believe that it is to the benefit of the State's reputation to have a high standard for our wheat, a greater number contend that the farmer himself does not reap any direct benefit. Every one of them will readily admit that a wheat weighing 64 lb. to the measured bushel is of greater intrinsic value than a sample weighing only 61 lb., but many confidently assert that the action of the wheatbuyers in refusing to pay anything extra for over-standard samples is not consistent with the view that the heavier the wheat the better the price it will fetch in the world's markets. In this connection a study of the f.a.q. standards fixed in the three wheat-exporting States of Australia during the past ten years will be of interest. The following table gives the standards fixed each season:—

F.A.Q. STANDARDS FOR WHEAT.

	N.S. Wales. lbs. per bush.	S. Australia. lbs. per bush.	Victoria. lbs. per bush.
1895-6	—	63	61 $\frac{1}{2}$
1896-7	—	63	61
1897-8	—	62	61
1898-9	61	63	62 $\frac{1}{2}$
1899-1900	61	63	62 $\frac{1}{2}$
1900-01	61 $\frac{1}{2}$	63	62 $\frac{1}{2}$
1901-02	61 $\frac{1}{2}$	62	61
1902-03	—	63	—
1903-04	61	61 $\frac{1}{2}$	60 $\frac{1}{2}$
1904-05	59 $\frac{1}{2}$	63	61 $\frac{1}{2}$

These figures show that in every instance South Australia has a higher standard than Victoria or New South Wales, varying from $\frac{1}{2}$ lb. per bushel to $1\frac{1}{2}$ lb. per bushel above Victoria, and $\frac{1}{2}$ lb. to $3\frac{1}{2}$ lb. per bushel above the standard of New South Wales. This being so, it follows that, should our title question be answered in the affirmative, South Australian wheat is always worth more than that of either of the neighbouring States. In this connection it will, of course, be understood that we are speaking of our f.a.q. wheat, and not of special qualities.

Does the South Australian farmer get a better price for his wheat than the farmer in New South Wales or the farmer in Victoria, who sells under a lower standard? This question is a very difficult one to answer. We cannot compare telegraphed prices of London sales of cargoes, because the size of the cargo, the date of delivery, and conditions of charter, etc., may all affect the position, and we are therefore

compelled to fall back on the daily published prices of wheat at the three principal ports, viz., Sydney, Melbourne, and Port Adelaide. In the following table, therefore, we give the prices at each port on January 31 and February 7—or the nearest dates thereto—of each year:—

Year.		Melbourne. Prices.	Sydney. Prices.	Port Adelaide. Prices.
1895-6	{ January 31	5 0	Imptd. wheat quoted	4 1
	{ February 7	5 0	"	4 2 $\frac{1}{2}$
1896-7	{ January 31	5 8	"	5 8
	{ February 7	5 9	"	5 8
1897-8	{ January 31	3 5 $\frac{1}{2}$	4 1	4 5
	{ February 7	4 3	4 2	4 5
1898-9	{ January 31	2 6 $\frac{3}{4}$	2 7	2 7
	{ February 7	2 6 $\frac{1}{2}$	2 8	2 6 $\frac{1}{2}$
1899-00	{ January 31	2 8 $\frac{1}{2}$	2 9	2 8
	{ February 7	2 9 $\frac{1}{2}$	2 8 $\frac{1}{2}$	2 8
1900-01	{ January 31	2 8	2 7	2 8
	{ February 7	2 8	2 7	2 8
1901-02	{ January 31	3 1	3 1	2 11
	{ February 7	3 5	3 1	2 11
1902-3	{ January 31	6 3	6 1	5 10
	{ February 7	6 3	6 4	5 10
1903-4	{ January 31	2 9 $\frac{1}{2}$	2 9 $\frac{1}{2}$	2 10
	{ February 7	2 10	2 9 $\frac{1}{2}$	2 9
1904-5	{ January 31	3 4	3 4 $\frac{1}{2}$	3 4 $\frac{1}{2}$
	{ February 7	3 4 $\frac{3}{4}$	3 4	3 4

In dealing with these figures the prices during seasons 1895-6, 1896-7, 1897-8, and 1902-3 must be discarded, as the market was governed, not by London prices, but by comparative failure from an export point of view of the Australian crops. The figures in each case are taken from *The South Australian Register's* daily telegrams, and, assuming that they are correct, they unquestionably indicate that, with a very few exceptions, the price for wheat at Port Adelaide is lower than at either Sydney or Melbourne, notwithstanding our higher standard; and, moreover, the Port Adelaide figures are given as f.o.b., while often the prices in the other States are quoted "ex trucks" or "ex store." If, then, a high standard means higher prices for our wheat in the London market, who reaps the benefit? Apparently it is not the farmer. In *The Register* of February 21 Messrs. J. Darling & Son mention current London quotations for Australian cargoes of wheat as follows:—"New South Wales, 32s. 3d. to 32s. 6d. per quarter; Victorian, 32s. 6d. to 32s. 9d. per quarter; South Australian, 32s. 9d. to 33s. per quarter." These prices therefore show that with a higher standard our wheat is worth 3d. per quarter more than Victorian. This works out to less than a half-penny per bushel increase in price for 1 $\frac{1}{2}$ lb. higher standard; yet the farmer who delivers wheat equal to the Victorian standard would be docked 1d. to 2d. per bushel by the South Australian wheatbuyer.

ANALYSES OF FERTILISERS.

The following results of analyses of samples of fertilisers taken by the Inspector of Fertilisers during the past three months are published for general information. In each case the certificate of constituents or guarantee registered by the vendor is shown in brackets, thus—(36 per cent.)—immediately before the results of the analyses:—

ELDER, SMITH, & CO., LIMITED.—Lawes' Superphosphate—Water-soluble phosphate (37 per cent.), 38 per cent., 38·6 per cent., 36·5 per cent., 38 per cent.

CLUTTERBUCK BROTHERS.—Elder Superphosphate—Water-soluble phosphate (37 per cent.), 38·9 per cent., 38·6 per cent.

ADELAIDE CHEMICAL AND FERTILISER CO., LIMITED.—Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 38·6 per cent., 39·8 per cent.: citrate-soluble phosphate (2 per cent.), not tested: acid-soluble phosphate (6·5 per cent.), not tested.

ADELAIDE CHEMICAL AND FERTILISER CO., LIMITED.—Guano Superphosphate—Water-soluble phosphate (25 per cent.), 32·2 per cent., 33·8 per cent.: citrate-soluble phosphate (5 per cent.), 4·7 per cent., 2·8 per cent.: acid-soluble phosphate (3 per cent.), 3·2 per cent.

GEORGE WILLS & Co.—United Alkali Co. Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 38·5 per cent.

D. & J. FOWLER, LIMITED.—Albatross Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 37·3 per cent.

WALLAROO PHOSPHATE CO.—Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 39 per cent., 39·5 per cent.

NORMAN & Co.—Reliance Superphosphate—Water-soluble phosphate (34 per cent.), 36·8 per cent., 36·3 per cent.: acid-soluble phosphate (3 per cent.), not tested.

AUSTRALASIAN IMPLEMENT CO., LIMITED.—Farmers' Favourite Fertiliser—Water-soluble phosphate (36 per cent.), 38·9 per cent., 36·2 per cent.

ADELAIDE CHEMICAL AND FERTILISER CO., LIMITED.—Wheat Manure—Nitrogen (1·05 per cent.), 0·9 per cent.: water-soluble phosphate (28·1 per cent.), 29·1 per cent.: citrate-soluble phosphate (5·9 per cent.), 6·8 per cent.: acid-soluble phosphate (6 per cent.), 8·2 per cent.

ADELAIDE CHEMICAL AND FERTILISER CO., LIMITED.—Bone Superphosphate—Nitrogen (1·6 per cent.), 1·4 per cent., 2 per cent.: water-soluble phosphate (15·2 per cent.), 27·4 per cent., 20·4 per cent.: citrate-soluble phosphate (15·8 per cent.), 10·9 per cent.: acid-soluble phosphate (6·8 per cent.), 13 per cent.

S.A. FARMERS' CO-OPERATIVE UNION.—Black Horse Superphosphate—Water-soluble phosphate (36 per cent.), 37 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Bone Manure—Nitrogen (3·5 per cent.), 3·6 per cent.; acid-soluble phosphate (30·5 per cent.), 39 per cent.

EXCELSIOR MANURE Co.—Bone Manure—Nitrogen (2 per cent.), 3 per cent.; acid-soluble phosphate (30 per cent.), 32·2 per cent.

EXCELSIOR MANURE Co.—Bonedust—Nitrogen (3·25 per cent.), 3·5 per cent.; acid-soluble phosphate (44 per cent.), 45·2 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Bonedust—Nitrogen (2·5 per cent.), 3·1 per cent., 4·1 per cent.; acid-soluble phosphate (45 per cent.), 50 per cent., 44 per cent.

L. CONRAD.—Bonedust—Nitrogen (3·6 per cent.), 2·9 per cent.; acid-soluble phosphate (43·6 per cent.), 48·6 per cent.

NORMAN & Co.—Reliance Thomas Phosphate—Acid-soluble phosphate (30 per cent.), 28·4 per cent.

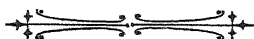
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CIDERMaking.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 370.)

STORING THE CIDER.

The filtered cider goes direct from the filter into the barrel in which it is to be stored. The barrel is nearly filled, and immediately bunged down tight. It should be numbered with a distinct number, which will, if proper records are kept, enable the whole of its history to be looked up at any subsequent date. The great necessity for these barrels to be scrupulously clean need not be enforced. There is, however, one point of importance on which opinions seem to differ, but on which I have no hesitation in saying there is no ground for difference of opinion, viz., as to how the barrels should be stored. The barrels must be stored on their sides, and not on their ends. I have noticed, when visiting various farmhouses, that much of the cider is stored in casks kept upright. As the result of both observation and experiment, I find that cider so stored does not keep so well as when the barrels are laid down. Cider is more liable to become acid in an upright barrel than in a barrel laid down. Now, cider does not become acid *unless air gets to it*. In fact, the longer cider is kept free from air, the less acid it becomes. Why does air get to it more readily when the barrel is upright? I think the reason is not difficult to find. Whenever a barrel is thoroughly cleaned the head is the part taken out. It may be replaced with skill, but it is never so tight as it was originally. So long as it is wet it may be tight; but if allowed to get dry, it opens more readily than other part of the barrel. When the barrel is upright the head does get dry unless special means are taken to keep it moist, and these are seldom satisfactory. Therefore, air reaches the cider, the alcohol undergoes a change, and is slowly converted into acetic acid (vinegar).

As an outcome of the investigations, the cellars at Butleigh have been completely rearranged, so that no barrel is allowed to stand on its end. Some correspondence has taken place in the public press as regards the desirability of thus arranging the barrels. In the principal wine-producing factories in the world, however, one of the most striking facts is that nearly all of the barrels are lying down. The only exceptions seem to be the very large blending vats employed, and even these are not always upright. Thus the large vat of Messrs. Moët and Chandon, of Epernay, which holds 12,000 gallons, is not on end, and in photographs of the vatting-room of this same firm not a single barrel can be seen on end, though in places they are stacked in five rows. Surely this arrangement, adopted by old-established wine manufacturers, cannot be due to any accident, but is done deliberately and with a purpose; and it is a strong confirmation of the necessity of keeping the barrels on their sides. In fact, if you wish the cider to keep, the barrels must not stand on end.

The storing barrels should not be spiled until it is absolutely necessary. The custom of spiling casks, and now and again drawing a little out for friends to taste, is a fertile source of deterioration. The air gets in after each drop is drawn (unless the cider is highly carbonated, *i.e.*, contains a large quantity of gas), and then vinegar fermentation starts. The spiles sometimes leak a little, the cider trickles down the barrel, and in hot weather you will find a slimy mass where the cider has run. This growth is injurious to the cider, and should never be allowed to exist in a cider cellar. Keep the outsides of the casks scrupulously free from it, for when next you draw a glass of cider from such a cask, the chances are that, in replacing the spile, you will introduce some of the slimy growth to carry on its destructive action inside the barrel. The remedy for each of these evils is easy and obvious. Do not spile the barrels until you wish to sell, and are bound to sample.

DRAWING FROM BARRELS.

Cider, except that which is stored in bottle, must of necessity be stored in large barrels. When it is required to send away a small cask, containing 12, 18, or 36 gallons of cider, it is necessary to draw this quantity from one of the large storing barrels. Experience has proved that the cider remaining in the storing barrel, after this abstraction has taken place, will not retain its high quality. Now, the reason for this is simple. If 18 gallons of cider are taken out of a barrel, the same volume of air must be drawn in. The result is nearly always injurious to the cider. In the first place, the air so drawn into the barrel is liable to be polluted with germs which might set up an undesirable fermentation. Even if this air be first purified by passing it through a special bung made for the purpose, the air which enters may still be productive of harm by starting fermentation anew, or by enabling the acetic acid ferment, should it be present in the juice, to commence its baneful action.

To overcome these difficulties, a cylinder of compressed liquid carbonic acid was obtained in 1897, together with a pressure gauge and reducing valve, which apparatus is necessary to enable us to use the gas. By connecting the cylinder of carbonic acid gas with a barrel it is possible to draw from this barrel as much cider as is required without allowing any air to enter, the place of the cider being immediately taken by the carbonic acid gas. This same gas is produced by the natural fermentation of the apple juice, and acts as a preservative so long as the juice is thoroughly impregnated with it. Hence, by its application in this way we do but maintain artificially the condition which ordinarily Nature has brought about in a cask. There is this further advantage. When cider is in cask it is, or rather should be, fully impregnated with the carbonic acid gas produced by fermentation; but in drawing the cider out of the barrel much of this gas is lost. If, however, the cider be drawn out of the barrel by, or under, pressure, then there is much less fear of the gas escaping when the cider is being drawn into a small

cask. The result is that the cider in this small cask will keep longer, and be of better quality, than if the gas had been allowed to escape. The above results are of importance, not only to the cidemaker, who has to draw cider from large into small barrels: but also to those who wish to bottle nearly dry cider, or to produce a bottled cider which, while having ample life when the bottle is open, shall yet not have the superabundant effervescence of champagne.

BOTTLING.

Cider when exposed to the air is liable to rapidly turn sour. From personal experience I know that cider would be drunk in many London homes were it not that, the consumption being small, by the time a cask is half emptied, what remains is not fit to drink. Partly owing to this, partly to the fact that most bottled cider placed on the market, until quite recently, has been either too sweet, too gaseous, or too dear (as compared with cider in cask), the consumption of cider has been comparatively small. It therefore appeared to be desirable to experiment upon the effects of bottling, as I am quite certain that if cider is to become a popular drink it will have to be supplied mainly in bottles.

The chief advantage of bottling is that cider almost invariably improves in flavour by keeping, or, perhaps, to state it more precisely, during the time it is in bottle. The disadvantage is that, even if bottled directly it comes from the filter, when it is absolutely clear and sparkling, in course of time a deposit forms in the bottle. This deposit, however, should be small, and, if the bottles are kept upright for a day or two before being opened, it sinks to the bottom, and the contents of the bottle may then be poured off without disturbing the sediment. The cider contains enough gas to be "bright," but is not too effervescing.

If the cider is not clear when bottled, then a copious deposit is formed. Fermentation proceeds too far, and sometimes the bottles burst, or the juice becomes so highly charged with gas that it is impossible to obtain the contents of the bottle without the whole of the sediment rising up. The production of effervescing bottled cider appears, therefore, to be a branch of the industry which the ordinary farmer had better not attempt. On the other hand, the production of a good, fairly clear, and moderately sparkling bottled cider, for one's own consumption, or to supply to neighbours who are not cidemakers, is not attended by much difficulty, especially where the use of a filter is procurable. The cider must be absolutely clear for bottling, and it should be bottled direct from the filter. This is the result of long-continued experiments. The experiment was tried of leaving the bottles open for twelve hours after they were filled, and before closing them; the results proved conclusively that much better cider was obtained by closing the bottles immediately after they were filled. Experiments were also made to determine whether it was better to bottle cider as it comes from the filter or after it had been subsequently stored in barrel. A good cider was filtered on January 19, and several dozens of bottles

were filled. The remainder of the cider was placed in a cask and on March 19, *i.e.*, two months after filtering, was bottled direct from the cask. The bottles were kept until the following January, when the two varieties were most carefully tasted. There was a unanimous opinion that the cider bottled direct from the filter was of far better quality than the cider bottled from the cask two months later.

Many experiments have been made to determine the best time and condition of the cider for bottling. It is found that if bottled with a gravity of or above 1.025, the subsequent fermentation will break many of the bottles, or else cause a considerable loss from leakage. Moreover, in those bottles which do not break a large deposit is formed, which, even if first allowed to settle, has a tendency to rise when the bottle is opened, owing to the rapid evolution of gas, so that the liquid cannot be poured out clear. Strange to say, in spite of this large deposit of material, the amount of alcoholic fermentation which has taken place is comparatively small. It has, therefore, been found desirable not to bottle until the cider contains as much alcohol as is desired in the cider when it has to be consumed, or at least 4 per cent. of alcohol. For example, if the average gravity of the juice from press was 1.058, it will not contain 4 per cent. of alcohol until the gravity has fallen to 1.023, and it will then contain over 4 per cent. of sugar, and so be a medium sweet cider. No fixed gravity can be laid down as a standard for bottling. It must first depend in a great measure upon the quality of the original apple juice. The gravity, however, must not be higher than 1.025, and the cider when bottled must not contain less than 4 per cent. of alcohol. Having satisfied these primary conditions, the gravity must next be regulated by the desire to make sweet, medium, or dry cider.

Good, sweet, bottled cider can only be made from juice having originally a high specific gravity. When the original gravity of the juice is below 1.063, it is only possible to make good medium dry cider for bottling.

For dry cider, the liquid when bottled should contain only about 2 per cent. of sugar, and this corresponds nearly always to a gravity of 1.010. The cider at Butleigh is bottled in screw-stoppered, clear, light-green bottles, holding one-sixth of a gallon. If the bottles are more expensive than ordinary corked bottles, they have many advantages. There is no trouble about corks, and cider can be easily spoiled by bad corks. They do not require tying or wiring down, nor is it necessary to cap them with foil in order to make them look well. That the public prefer these bottles is certain. A glass of cider can be drawn out, and the bottle immediately restoppered, so that the remaining cider can be used at a subsequent meal, even 24 hours later.

After being filled the bottles should be stored in bins on their sides, not upright, and the bins carefully labelled to correspond with the barrels.

DISGORGING.

Champagne cider is made either by allowing an excessive amount of fermentation to take place in the bottle, and then removing the sediment, or by filtering the juice and artificially aerating with carbonic acid gas. The latter process is only capable of being carried out in factories. The former is the system adopted in the champagne industry, and is the most difficult and expensive to perform. But experiments were made at Butleigh, and the results were satisfactory. The system is as follows:—

After fermentation has proceeded sufficiently the bottles are placed in a frame sloping so that the mouth is downward. Every day or two each bottle is twisted half-way round. The sediment gradually collects in the neck of the bottle, and finally upon the cork. Unfortunately, it is necessary to have corked bottles for this operation, unless it can be performed under special conditions. When the sediment has thus collected the cork is drawn out, the bottle being held mouth downward, and the sediment is washed away with a little cider which escapes. The cork is immediately replaced and fastened down. This operation, termed disgorging, is exceptionally difficult to carry out, and requires a certain amount of apparatus as well as skill. It is now performed on a large scale by freezing the cider in the neck of the bottle, removing the cork, scraping out the small portion of ice which contains the sediment, and re-corking with a clean, new cork.

Where this method of operating is carried out screw-stoppered bottles might be used. The process is costly, and cannot be generally adopted until better prices can be obtained for really excellent champagne cider, which is quite as good as real champagne, and is perhaps not unfrequently sold as champagne.

RECORDS.

Those who wish to succeed in cidermaking must carefully record every fact regarding each barrel of cider made. The work that is done from day to day should be recorded in a day-book, and a cellar-book (or cider-ledger) will subsequently have to be filled up from the day-book. I have drawn up the two following forms for these records, which I recommend to those who desire to keep an accurate account of their work. Two books of such forms (the best size is foolscap), in which were carefully recorded what is done each day, would well repay the small amount of time and trouble involved. Moreover, a new interest would be given to the work of cidermaking.

The conditions of cidermaking differ on every farm; the apples, the soil, the climate, all affect the resulting liquid. The most that could be done at Butleigh was to seek out some of the more general conditions which affect all makers. But the special conditions which exist at any farm will always play an important part in the manufacture of cider there, and each maker must find out for himself what these conditions are. If records somewhat similar to if not identical with the following were kept, these conditions would soon be discovered, and could be utilised to advantage:—

FORM OF CELLAR-BOOK, OR RECORD OF BARRELS WITH THE FIRST OF
ABOVE ENTRIES COPIED IN AND CONCLUDED.

Barrel No.	...	...	...	...	...	22
Made on	...	...	...	...	...	Nov. 8, 1897
Apples from	...	...	...	...	...	Cook's Orchard
Condition of Apples	...	...	...	...	...	Good
Specific gravity of Juice	...	...	...	...	...	1.055
Temperature when keeved	...	...	...	...	...	50° F.

Skimmed.

—	First time.	Second time.	Third time.
Date	November 11	November 12	—
Nature of head	White	White	—
Temperature when skimmed	52	53	—
Gravity when skimmed	1.052	1.052	—

Temperature of Juice in barrel	...	...	...	...	54
Specific gravity of Juice in barrel	...	...	...	...	1.051
Special treatment	...	...	...	...	Pips cracked

Racked.

—	First time.	Second time.	Third time.
Date	December 10	—	—
Temperature	51	—	—
Specific gravity	1.029	—	—

Filtered.—Date, Dec. 18: temperature, 49: specific gravity, 1.026.

Condition of liquid.—Good flavour: clear, but not bright: pale.

Subsequent Treatment.—March: bottled 12 dozen, and drew off remainder into casks under carbonic acid pressure.

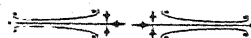
Taste and Quality.—Still excellent.

Remarks.—The bottled cider consumed partly at home. Some sent to yacht club was found excellent, and suited members' tastes.

Cask sent to Sir A. B. He writes:—"It is far too sweet for my taste."

Cask sent to D. E. F. He wrote:—"Very clean, but not sweet enough for my taste."

(To be continued.)



SOME NOTES ON THE EXPORT TRADE IN FRUIT WITH EUROPE.

By GEORGE QUINN, Horticultural Instructor.

With the present season the export of apples as a regularly established line of trade from this State to Europe will have passed its first decade. Although the results have been varied, the experience gained during that time has been valuable. Steady progress has been made, for, while the quantities have gradually risen from about 600 cases in 1895 to the respectable total of about 100,000 in 1904, the quality of the product has thus far been fairly well maintained. There are signs, however, that with the increasing importance of the trade this greatest desideratum of all may not seize upon the minds of our growers with the same intensity as heretofore. Her geographical position gives South Australia many advantages over her sister States in the export of fruit to Europe. The climatic conditions prevailing here enable our growers to produce and pack apples of the best kinds in a more matured condition, and at an earlier date than our neighbours in Victoria or Tasmania can hope to attain. Added to this, the fruits grown in all but our most distant localities may remain upon the trees several days longer than those intended for export by the same vessel from the eastern States. The South Australian fruits, though perhaps not so juicy, certainly possess better carrying powers than those from the eastern States, where the rainfall is usually more generous and the sun heat less intense.

In the handling of the cases the other States enjoy better facilities at the ship's side, but, with the completion of our outer harbour works our present disability in this direction should in a very great measure disappear. In many instances when the ship completes the stowage of the insulated cargo at Largs Bay the South Australian fruit is found on top of that from the other States. At any rate, whether this be the case, or whether the Adelaide fruit occupies separate cool rooms, it usually receives whatever benefit accrues from being the last to go into the insulated space, and, owing to this position, it is more likely to be the first fruit removed when the boat reaches its destination. With few exceptions, the fruit-carrying ships now land their cargoes in fair condition, and there is every reason to be hopeful that the eventual effect of the new Commonwealth law dealing with these matters, combined with a healthy rivalry between the different shipping lines, will certainly tend to diminish the chances of whole cargoes of fruit being landed in a wet or damaged condition. The handling of the cases of fruit on the way to the ship, when on railway, trolley, or lighter, calls for considerably more care than is usually granted to them. In this respect the sympathies of all of those concerned need awakening from the side of that lever which controls all human actions, viz., self-interest. The Fruitgrowers' Associations and their representatives on

other councils have moved in a commendable manner as far as the railway authorities are concerned, and it is to be hoped they will lose no opportunity of keeping before the managers of railways, carrying companies, and shipping agents, as well as shipping companies, what potentialities there are in the fruit trade for each of them, providing it be carefully fostered. By showing that they study his interests, and, by so doing, uphold their own, the confidence of the grower will be gained; and unless such confidence be engendered in the minds of the producers this trade will ever remain a lame and tardy thing, yielding profit and satisfaction to but few.

On the side of the grower much remains to be attempted. During the period under review much has been accomplished, although the results in concrete appear small to the uninitiated. The packing and grading have improved, but in these there is still much to be achieved. While we have not yet acquired that celerity which characterises the work of the Tasmanian packer, we have succeeded in landing the contents of the cases in Europe in a less bruised condition. From the age of paper clippings of fantastic colours, which absorb the slightest moisture and become a heavy impressionable mass, or from "cocky chaff," with its mould-inducing flavours, we have risen to the universal use of the elastic and attractive wood wool, which, it is safe to say, ten years ago was quite unknown to our fruit packers.

In the matter of grading, some few exporters are emphatic over their good returns, though they declare they pay no heed to this consideration. It may be that the many other excellent qualities possessed by the produce of these few individuals condone to a very great degree for their failure to observe this practice, which is advocated the world over. We, however, look forward with hope to the time when some inventive brain shall put our packers in possession of mechanical appliances which, while failing to injure our apples, may grade them with the accuracy which machines now display in the manipulation of citrus fruits.

The packages used in this trade, though partly framed on the lines of those used by our American cousins, are nevertheless Australian in character. The Intercolonial Conference of Fruitgrowers, held at Brisbane in 1897, recommended the adoption of what is known as the Peacock case for hard fruits. On returning from that gathering the writer's recommendation to that effect was akin to the "voice of one calling in the wilderness," where every man, in the matter of fruit cases, was a law unto himself. To-day no other case is seen wherever in our State apples are being packed for oversea trade.

Further, instead of the long case with its ugly external cleats, supposed to ensure ventilation, we now have the Peacock case, with its side battens so regulated in thickness (thanks to that veteran fruitgrower, Mr. James Lang, of Harcourt, Victoria) that no cleats are required, and a better system of airing is secured. Again, in the matter of packing pears we have long contended that this fruit would not become a regu-

lar item of the trade until the large, deep packing case gave way to the adoption of shallow cases or trays. These, in a very improved form, are now being used, and the establishment of the export of this delicious fruit may be confidently expected at no distant period.

There are one or two seemingly minor points which may be worthy of the attention of our orchardists, and out of which important results may arise. In the first place, this season has demonstrated that the South Australian growers may get two or three shiploads of apples into the European market in advance of the Tasmanian shippers. In their efforts, however, to grasp this opportunity, I am afraid many mature fruits of inferior sorts, and numbers of immature specimens of valuable kinds, which have already gained a European reputation, have been packed and put into these early shipments. The way out of this difficulty obviously lies in the selection or development of one or more varieties possessing excellent carrying powers, combined with early ripening and highly flavoured qualities, while the appearance should be attractive. Our plantations at present have not yet yielded anything to fill this bill quite as satisfactorily as could be wished, and should the Government collection at Mylor lift us out of this difficulty it will not have been established in vain. Our past experiences, however, point rather in the direction that the realisation of our hopes will eventually rest largely upon varieties of Australian origin, for in those already proved of high value one or two native productions figure very prominently indeed. Another point very noticeable is the need of uniformity in marking the grades of the popular varieties. At any rate, this will be so whilst grade marks are in vogue. Like the practice which has grown up in the Italian citrus trade, we believe the time is not far removed when, instead of marks indicating the grade which the caprice of the packer may direct, every box will bear, besides the name of the variety, simply the number of the fruits it contains. This would be a far better guide than a grade mark, which means anything from apples $2\frac{1}{2}$ to $3\frac{3}{4}$ in. in diameter, just as the whim of each different packer causes him to imagine his fruits should beat creation, instead of being what they really are. This lack of uniformity may be further instanced by stating that some packers mark their fruits with the letter A, and as the apples comprising the contents of the cases diminish in size the number of A's increase. Others, again, while using the same grading marks, follow an order exactly the reverse to this. If our exporters are determined to continue to indicate the sizes by grade marks, it surely would be a simple thing for them to confer together and agree upon certain marks as indicating a certain standard for South Australian fruit.

There is also much need for uniformity in the naming of the apples. From South Australia we send one apple under two names, viz., Cleopatra and New York Pippin, while among Victorian and Tasmanian shippers the last name is in general adoption. By carefully

analysing the results of their carrying and selling qualities, the varieties now being packed have been narrowed down from 48 in 1897 to about 10 in 1904. In this direction the future, doubtless, will show a further diminution. Although new kinds may be added to the favoured list, others now on trial will probably give opportunities to our growers to exercise the grafter's art in the near future. We already possess several good paying kinds which answer the requirements of the medium and later boats, but, as before mentioned, what we now need are varieties which reach maturity from the first to the third week in February and at the same time possess that necessary combination of carrying and selling qualities which is at present confined to the later kinds.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, Superintendent of Vineyard.

All is in active preparation for the vintage, which begins during the coming week. The yield will be light, consequent on the dry season and the ravages of the starlings. These birds removed about seven-eighths of the crop of currants, and are now doing their best to treat the rest of the grapes in a similar manner.

February has been remarkably cool, retarding the ripening very considerably. However, as there is not an excess of juice in the fruit we hope to have it fairly dense. The crop has been somewhat revived by a couple of good thunder showers, but it is still very far from what it should be. At one time the prospects warranted an estimated yield of eight thousand gallons of wine, but now we shall probably not reach four thousand.

Unfortunately, our manure experiment plots will be of little value this season, the vines on this portion of the vineyard having been among the worst sufferers from the frost in the spring.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, February 8, there being present Colonel Rowell, C.B. (Chairman), Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, J. Miller, R. Marshall, and A. M. Dawkins.

The Secretary of Agriculture reported that the Hon. Minister had decided that an officer of the Department of Agriculture should make a special enquiry into the complaint causing so many losses of cattle. Members expressed their satisfaction at the action of the Minister in giving effect to resolution passed at previous meeting.

The Secretary reported that the South-Eastern Conference of the Agricultural Bureau would be held at Naracoorte on April 5, and the Southern Conference at Strathalbyn on March 30.

The following gentlemen were approved as members of the under-mentioned Branches:—Mr. M. Cain, Morphett Vale: Mr. J. Mitchell, Strathalbyn: Mr. J. Rearden, Cherry Gardens: Mr. O. Uppill, Bala-klava: Messrs. P. Kelly and W. Longbotham, Riverton: Messrs. H. Buck, A. Dow, F. Holloway, A. Sassanowsky, R. Smith, and J. Vor-weck, Mount Gambier: Mr. H. Zengofsge, Morgan: Mr. G. Higgs, Inkerman: Messrs. T. Sage, C. Murray, L. Plush, and A. B. Robin, Angaston: Messrs. C. Fuller and J. Oldland, Mount Remarkable: Mr. P. Pascoe, Clare.

Mr. Molineux stated that recently near the Murray Mouth he saw enormous flocks of starlings, which appeared to be increasing very rapidly in that locality. They were undoubtedly large eaters of insects, and it was a great pity they had taken to eating fruit. Mr. Laffer stated that they were now attacking the apples and pears, but he believed that if arsenic was sprinkled on the fruits attacked it would destroy the birds, as they eat the whole of the pulp, leaving only a little of the skin. He was glad to notice that Victoria had put a stop to the proposed importation of certain birds which were likely to be injurious to the growers. Some time ago the Council passed a resolution asking that the Government should obtain power to control the introduction of birds or animals, but apparently nothing had been done in the matter. Other members instanced losses in vineyards, gardens, and cereal crops caused by starlings, and it was agreed that these birds were a very serious evil.

Mr. Sandford said that the outbreak of swine fever was having a very depressing effect on the industry. Although prices for pork, bacon, and hams were lower than usual, the demand had fallen off considerably. He attributed this to the fact that the public had obtained the impression that they ran the risk of buying meats from pigs that had been suffering from the complaint. As a matter of fact, however, the consumers never had healthier or primer pork offered them, as, owing to the outbreak, no pigs could be sold until they had been carefully examined and passed by the Inspector of Stock. He said without hesitation that there was no danger whatever to the consumer under the present system.

Mr. Miller called attention to the necessity for vigorous action in dealing with rabbits. The provisions of the law in respect to simultaneous action were hardly ever carried out, and in many cases little, if anything, was done. Matters had lately gone from bad to worse owing to the recent Supreme Court decision in a test case brought against a landowner who neglected to destroy the rabbits on his holding. No council could now, under the present laws, secure a conviction against the offenders. Members generally appeared to hold the view that there should be some central authority to compel the local governing bodies to give effect to such laws as the Vermin Destruction Act, Width of Tires Act, Thistle and Burr Act, and others, as under the present sys-

tem many bodies simply took no action in these matters. On the motion of Mr. Miller, it was resolved—“That the attention of the Hon. Minister be drawn to the unsatisfactory state of the Vermin Destruction Acts, as evidenced by recent failures to secure convictions against persons neglecting to destroy the rabbits on their holdings, and that the Council urge upon the Minister the necessity for taking action to secure effective legislation at as early a date as possible.”

Mr. Laffer called attention to the proposed Fruit Show in Brisbane in August, and thought that as there was an opening for our fruit in Brisbane the State should be represented. He noticed that the Victorian Department had decided to make a representative exhibit. The Secretary stated that the Hon. Minister had asked the Committee of the South Australian Fruitgrowers' Association to co-operate with the Department in the matter of securing a good collection of fruit for the show. The fruit would be held by the Department in cold storage until required for the show.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on March 1, 1905:—

As a set-off to the extreme heat waves referred to in our former, February has to a certain extent compensated, there having been only a few days of anything approaching high temperatures. Indeed, the month can be best described as cooler than usually experienced at the time of year, but the rainfall has been light; result, viticulturists and fruitgrowers report a considerable shrinkage in the crops.

COMMERCE.—In mercantile circles there is a unanimity that country trade is undoubtedly on a much more substantial footing than known for many years, the excellent harvests being directly responsible for the decided improvement, besides giving a stimulus to business in the areas that has not existed for a very long time. The city has scarcely participated to the same extent, but, taking all round, a very healthy condition of trade has been recorded. At Broken Hill the silver mines have well confirmed predictions, the output showing a further substantial increase. In Metals Silver has hardened and Lead values have also considerably recovered, whilst Copper is reported firm.

BREADSTUFFS.—In our previous report mentioned there was a dulness in cargoes for Great Britain. This continued for some time, but the market is now steady at 33/- for South Australian; Victorian cargoes are valued at 3d. per quarter less; and New South Wales at 6d. In Victoria the heavy deliveries of Wheat appear to have been checked, and 3/4½ to 3/4¾ is about fair value. Sydney millers are still buyers of prime samples at high rates, and shippers have to be content to take the wheat as it comes at lower prices. In South Australia farmers are not at all anxious sellers, and some buyers who have not quite covered their engagements are paying full rates for wheat to be delivered. Stored is offering more freely, but this does not help the shipper. Fodder.—Local trade in Chaff has been of the ordinary character; but, unfortunately, buying orders for New South Wales have tapered off until Victoria for the time being seems to have secured the business. Offal has been in strong request for home consumption, and millers' stocks are very low. Bran is quoted at 8½d., both in Sydney and Melbourne, so those States are doing the Western Australian business. Pollard is worth 1/- in Sydney and 10½d. in Melbourne. Feeding Grains.—Fair quantities have been disposed of for Broken Hill and Western Australia.

POTATOES.—The heavy demand during the early part of February speedily exhausted supplies from the Hills, so that the trade are now operating in “Gambiers,” and as the yield of their first or early crop was known to be light, there has been considerable fluctuation in values. However, towards the

close of the month rates steadied, this under the influence of several parcels coming along from Tasmania and Victoria. Onions.—Owing to the shortage it is quite expected tall prices will rule throughout the season, and although there is an easing shown of quite £1 to 30/, no further reduction in the immediate future is expected.

DAIRY PRODUCE.—Compared with the corresponding period of last year, quantities of South Australian butters marketed this season have been very much shorter. For extra requirements it is unusual that importations so early in the year have to be resorted to; buyers, therefore, have been operating much more eagerly for fresh in prints. Result, there is a substantial firming in all grades, but any further advance is precluded owing to the lower quotations offering from the eastern States. Eggs.—The seasonable shortage in quantities has evidently set in, but not sufficiently pronounced to cause anything like a sudden jump in selling rates. Cheese.—In view of stocks being light throughout Australia, all consignments have been readily snapped up at an advance on former quotations. Bacon.—It is seldom that such a dull market exists as at present, curers complaining bitterly at the meagre demand and also the continued lowering in values. Hams.—Excepting for a few export orders, local enquiry has been very moderate. Honey.—Apiarists are finding the new take not nearly up to expectations, so are now less disposed to force sales. Almonds.—Growers are busily gathering, but the market has scarcely yet established a quotation for the new crop.

In Live Poultry it was hoped that an upward turn of the market would have been again attained, but, unfortunately, values are kept back owing to the poor class of birds now being marketed, and farmers would do well not to forward until the birds were fit for table purposes.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/4½ to 3/5 per bushel of 60 lb.

FLOUR.—City brands, £8/5/- to £8/10/-; country, £7/10/- to £7/15/-.

BRAN.—10d.; **POLLARD**, 11½d. to 1/- per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/10 to 2/-, prime: White Champions, 2/1 to 2/3, prime.

BARLEY.—Feeding, 1/9 to 2/- per bushel.

CHAFF.—£3 to £3/2/6 per ton of 2,240 lb., f.o.b. Port Adelaide for prime green new.

POTATOES.—Gambiers, £7/10/- to £8 per ton of 2,240 lb.

ONIONS.—New locals, £10 to £11 for prime per ton of 2,240 lb.

BUTTER.—Factory and creamery fresh, in prints, 1/- to 1/2; choice separators and best dairies, 11d. to 1/-; well-graded store and fair dairies, 9½d. to 10d.; heated and stale, 8½d. to 9d.

CHEESE.—Prime new make, 5½d. to 6½d. per lb.

BACON.—Factory-cured sides, 5½d. per lb.; farm flitches and rolls, 4d. to 5d. per lb.

HAMS.—S.A. factory, 8½d. to 9d. per lb.

EGGS.—Loose, 9½d. per dozen.

LARD.—In bladders, 4½d.; tins, 4d. per lb.

HONEY.—2d. for prime clear extracted new season's, in 60-lb. tins: Beeswax, 1/- per lb.

ALMONDS.—Softshells, 3½d.; kernels, 7½d. per lb.

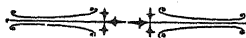
LIVE POULTRY.—Good table roosters, 1/6 to 2/- each; plump hens and fair-conditioned cockerels, 1/- to 1/5; mixed sorts, 10d. to 1/-; poor and weedy, 7d. to 9d.; ducks, 1/3 to 2/-; geese, 2/6 to 3/6; pigeons, 4½d.; turkeys, 5d. to 7d. per lb. live weight for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of February, 1905:—

Adelaide ...	0·25	Hoyleton ...	0·35	Macclesfield ...	0·19
Hawker ...	0·15	Balaklava ...	0·11	Meadows ...	0·66
Cradock ...	0·15	Port Wakefield ...	0·23	Strathalbyn ...	0·17
Wilson ...	0·17	Saddleworth ...	0·36	Callington ...	0·03
Gordon ...	0·20	Marrabel ...	0·25	Langhorne's Bridge	0·04
Quorn ...	0·45	Riverton ...	0·21	Milang ...	0·21
Port Augusta ...	0·01	Tarlee ...	0·35	Wallaroo ...	0·28
Port Germein ...	0·49	Stockport ...	0·23	Kadina ...	0·31
Port Pirie ...	0·03	Hamley Bridge ...	0·28	Moonta ...	0·18
Crystal Brook ...	0·07	Kapunda ...	0·27	Green's Plains ...	0·24
Port Broughton ...	0·12	Freeling ...	0·32	Maitland ...	0·25
Bute ...	0·11	Stockwell ...	0·17	Ardrossan ...	0·18
Hammond ...	0·42	Nuriootpa ...	0·24	Port Victoria ...	0·11
Bruce ...	0·75	Angaston ...	0·36	Curramulka ...	0·30
Wilmington ...	0·24	Tanunda ...	0·43	Minlaton ...	0·30
Melrose ...	0·30	Lyndoch ...	0·21	Stansbury ...	0·03
Booleroo Centre ...	0·14	Mallala ...	0·42	Warooka ...	0·28
Wirrabara ...	0·18	Roseworthy ...	0·16	Yorketown ...	0·10
Appila ...	0·23	Gawler ...	0·18	Edithburg ...	0·13
Laura ...	0·09	Smithfield ...	0·17	Fowler's Bay ...	0·33
Caltowie ...	0·13	Two Wells ...	0·12	Streaky Bay ...	0·08
Jamestown ...	0·15	Virginia ...	0·11	Port Elliot ...	0·09
Gladstone ...	0·08	Salisbury ...	0·11	Port Lincoln ...	0·15
Georgetown ...	0·09	Tea Tree Gully ...	0·47	Cowell ...	0·06
Narridy ...	0·11	Magill ...	0·63	Queenscliffe ...	0·16
Redhill ...	0·08	Mitcham ...	0·40	Port Elliot ...	0·19
Koolunga ...	0·29	Crafers ...	1·12	Goolwa ...	0·09
Carrieton ...	0·15	Clarendon ...	0·64	Meningie ...	0·29
Eurelia ...	0·15	Morphett Vale ...	0·29	Kingston ...	0·49
Johnsburg ...	0·12	Noarlunga ...	0·23	Robe ...	1·35
Orroroo ...	0·20	Willunga ...	0·29	Beachport ...	0·64
Black Rock ...	0·14	Aldinga ...	0·12	Coonalpyn ...	0·20
Petersburg ...	0·31	Normanville ...	0·23	Bordertown ...	0·24
Yongala ...	0·18	Yankalilla ...	0·20	Wolseley ...	0·16
Terowie ...	0·25	Endunda ...	0·15	Frances ...	0·13
Yarcowie ...	0·32	Truro ...	0·07	Naracoorte ...	0·32
Hallett ...	0·17	Palmer ...	0·32	Lucindale ...	0·54
Mt. Bryan ...	0·21	Mount Pleasant ...	0·09	Penola ...	0·70
Burra ...	0·29	Blumberg ...	0·16	Millicent ...	0·88
Snowtown ...	0·23	Gumeracha ...	0·30	Mount Gambier ...	1·37
Brinkworth ...	0·21	Lobethal ...	0·50	Wellington ...	0·23
Blyth ...	0·46	Woodside ...	0·27	Murray Bridge ...	0·15
Clare ...	0·65	Hahndorf ...	0·50	Mannum ...	0·11
Mintaro Central ...	0·49	Nairne ...	0·37	Morgan ...	0·41
Watervale ...	0·79	Mount Barker ...	0·23	Overland Corner ...	0·03
Auburn ...	0·45	Echunga ...	0·34	Renmark ...	0·32
Manoora ...	0·15				



AGRICULTURAL BUREAU REPORTS.

Longwood, December 16.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Vogel, Cheeseman, Oinn, and Hughes (Hon. Sec.), and three visitors.

EXHIBITS.—Sample of Timothy grass from low-lying ground was tabled. This is a very sweet and valuable grass. Red Juneating apples, the earliest variety grown in this locality, were also shown.

SUMMER PRUNING.—Some discussion on this subject took place. It was agreed that the time to prune must be governed by the situation, variety of tree, and the growth of the individual tree. In this locality trees on the hill slopes require to be summer pruned six or eight weeks earlier than those in the gullies.

Mount Bryan East, January 21.

PRESENT—Messrs. T. Wilks (chair), E. Wilks, Thomas, Bryce, Dare, Quinn, E. H. and R. H. Dunstan (Hon. Sec.).

VARIETIES OF WHEAT.—Some discussion on this subject took place. It was agreed that Gamma was a good rust-resisting wheat, but, as Purple Straw generally yielded better, and rust seldom does any damage in this district, members preferred it to Gamma.

Mount Remarkable, January 19.

PRESENT—Messrs. Casley (chair), Yates, Morrell, Smith, and O'Connell (Hon. Sec.).

BIRDS.—A lengthy discussion took place on the damages caused by starlings, crows, and bluebirds, the members being practically unanimous in their condemnation of these birds as enemies of the fruitgrower. Mr. Casley described a very effective bird-scarer manufactured by a local resident.

IMPACTION OR "DRY BIBLE".—As a preventive of this complaint, Mr. Smith recommended giving fine bonemeal, in bran and chaff, to the cows when green feed is lacking. Linseed oil, kerosine in new milk, and carbonate of soda were recommended by different members.

Nantawarra, January 21.

PRESENT—Messrs. R. Nicholls (chair), Greenshields, Dixon, Herbert, Belling, Bierwirth, and J. Nicholls (Hon. Sec.).

FORMALIN FOR BLACK RUST.—Several members reported having last season sown seed wheat pickled with formalin, as a preventive of black rust or flag smut, but as the crops generally were fairly free from this disease they did not consider the results conclusive evidence of the efficacy of the treatment.

IMPACTION OR "DRY BIBLE".—Several cattle have died recently in this district from this trouble. As losses throughout the State have, during the past thirty years, amounted to many thousand head of cattle, members thought a serious attempt should be made to deal with the disease. The feeling was expressed that did the authorities realise the magnitude of the losses to the State some definite action would have been taken ere this.

STRIPPER V. HARVESTER.—The Chairman reported having harvested a paddock of 70 acres of wheat with two damp-weather strippers and one combine harvester. The machines went round for round, the two strippers handling 124 bags clean grain, 2 bags floorings, 2 bags whitecoats, and 2 bags screenings, while the harvester reaped 66 bags of clean grain, and one of screenings.

Mundoora, January 19.

PRESENT—Messrs. Aitchison (chair), Stringer, Tonkin, Haines, Mildren, Owens, Dick, Shearer, Mitchell, and Gardiner (Hon. Sec.) and two visitors.

RABBIT DESTRUCTION.—Considerable discussion on this subject took place. Rabbits are very numerous throughout the district, and it was agreed that vigorous action on the part of the farmers was necessary to deal with the pest. The Chairman strongly recommended poisoning.

Inkerman, January 17.

PRESENT—Messrs. Kennedy (chair), Board, Lomman, Mugford, Williams, Fraser, C. H. and C. E. Daniel, F. I. and F. C. Smart (Hon. Sec.), and one visitor.

WHEAT YIELDS.—Members reported on yields of different wheats grown, and their suitability to the district. Gluyas had yielded well with all who had grown it, but as it is liable to go down badly members would not advocate sowing large areas of it. Neumann's is generally considered the best wheat for this locality. Steinwedel is still grown by a large number of farmers, while King's Early has done very well with some. Marshall's No. 3 is considered the best of the late wheats.

Eudunda, January 24.

PRESENT—Messrs. Walter (chair), E. T. and J. A. Pfitzner, Schwarz, Kluske, and Krummel.

BUREAU WORK.—The Hon. Secretary (Mr. W. H. Marshall) forwarded a paper on "How to Create a Greater Interest in the Bureau." The main purpose, he took it, of the Bureau was to forward the progress of every branch of agriculture, and to endeavour to improve the status of those engaged in agricultural operations. The aims of the Bureau could only be achieved by all of the members taking their share of the work. The work must not all be left to one or two. It should be the aim of each member to bring forward at each meeting some useful information or suggestion for discussion. During the weeks that elapse between each meeting there was surely time to find at least one item of interest—one useful idea—to bring forward at the next meeting. As their members' roll included farmers, dairymen, poultry breeders, woolgrowers, and others, the subjects of interest could cover a wide scope of ground. He also suggested the adoption of a regular programme, members taking it in turn to introduce a subject for discussion. Then they should endeavour to arrange for an occasional lecture by the Professor of Agriculture, and more interest should be taken in their experimental work, which he would like to see extended. The addition of agronomy classes and experimental plots at the State schools was also of utmost importance. The plots might be worked under the direction of the teacher, assisted by members of the Bureau, and prizes should be offered for the best kept plots.

EXPERIMENTAL PLOT.—Mr. Kluske reported that the experimental plot was sown last season with Bluey wheat, half the crop being manured with 70 lb. of mineral super per acre and half with the same quantity of South Australian super, but each yielded the same return, viz., 9 bushels per acre, which was satisfactory considering the season was so dry.

Utera Plains, January 21.

PRESENT—Messrs. Hornhardt (chair), West, Barrett, Gale, Watson, Deer, A. R. S. and A. R. Ramsey (Hon. Sec.).

BREAKING IN HORSES.—Mr. Barrett read a paper on this subject, and some discussion ensued.

RULES.—Considerable time was occupied in discussing and adopting rules for the management of the Branch.

Richman's Creek, January 23.

PRESENT—Messrs. Knauerhase (chair), Wright, Gebert, Kelly, Roberts, Donovan, Nicholson, J. H. and F. H. Lehmann (Hon. Sec.), one hon. member, and one visitor.

SEASON.—The Chairman gave a short address on the past season, which had proved very unsatisfactory to the farmers. Not only had the yields been small, but in many instances the grain was inferior. From a dairying point of view there had, however, been little to complain of, feed for stock having been abundant.

FEEDING HORSES.—Mr. Nicholson asked whether it was better to feed crushed wheat or bran and pollard to horses. Members generally agreed that it was better for the farmer to feed crushed wheat, but care must be taken to mix it evenly through the chaff, or there would be risk of the horses being foundered. It was also agreed that when feeding cocky chaff it should be damped before being mixed with either crushed wheat or bran and pollard.

RABBIT DESTRUCTION.—Much discussion took place on the recent Supreme Court decision, which had proved that the Vermin Destruction Act could not be enforced. Members were agreed that this was a very serious matter, especially to those farmers whose holdings were in close proximity to the land held by men who neglected to destroy the rabbits. As by the time legislative action could be secured the rabbits would have got beyond bounds, it was decided to ask the local District Council to call a public meeting to discuss the matter.

Lipson, January 28.

PRESENT—Messrs. Potter (chair), Provis, Swaffer, Bratten, Brougham, and Barraud (Hon. Sec.).

BEST WHEAT FOR DISTRICT.—Discussion on this subject took place. While members favoured a mid-season wheat for the bulk of the crop, they thought some early wheat should also be sown. Members were unanimous that if sowing only one variety of wheat they would choose Silver King.

CO-OPERATION IN THE SALE OF WHEAT.—A long discussion on this subject took place. Members thought it would pay farmers to store their wheat together at the shipping port, so as to be able to sell a whole cargo in one parcel, but they recognised that there would be great difficulty in getting the farmers to agree to sell at one time.

EXPERIENCE IN BREEDING LAMBS.—Mr. E. J. Barraud read a paper on this subject. On the mainland the breeding of lambs for export had developed enormously during the past eight years, and the industry had been exceedingly profitable to the farmers. This year alone farmers had received considerably over £100,000 for lambs. The question that concerned this district was: "Could the farmers participate in this trade?" In his opinion there was no doubt whatever on this point. Visitors to the Lipson Show who saw the exhibits of lambs there would have had any doubts as to whether the district could produce fat lambs quickly brushed away. Of course, the question of carriage from Tumby Bay to Port Adelaide must be considered, but with freight reduced to 1s. 6d. per head this was not of serious moment. Fat Merino lambs had been conveyed successfully by the steamers to Port Adelaide, and there need be no fear of the harder Shropshire-Merino lambs. Feeling convinced that the district could produce as good lambs as any other part of the State, he purchased 120 aged Merino ewes last year at 5s. 6d. per head, and three Shropshire rams at £3 3s. each. From the 120 ewes he reared 115 lambs, which sold at 12s. each, off shears, or £69 in all. The wool from the whole flock realised £32, and the ewes, as fats, would now fetch 3s. per head more than he paid for them. The actual returns, together with the enhanced value of the ewes, totalled £161 9s., while the cost of the flock was £42 9s., thus showing a balance of £119. Nothing, of course, is shown for attention, grazing, etc., but very little trouble was taken with them, and for the greater part of the time the sheep were running in a paddock of 140 acres, which was in crop the previous year. He was so well satisfied with his experiment that he intended to increase his flock, and he was confident that in the course of a few years large numbers of fat lambs would be sent away from Tumby Bay.

Forster, January 14.

PRESENT—Messrs. Towill (chair), G. and S. Retallack, F. and J. Johns (Hon. Sec.), and two visitors.

BEST VARIETIES OF WHEAT.—Some discussion on best varieties of wheat to grow in this district took place. The Chairman had tried King's Early, but it was not a success. Dart's Imperial and Gluyas had, however, done well.

Naracoorte, January 21.

PRESENT—Messrs. J. G. Forster (chair), H. A. Forster, Attiwill, Williams, Caldwell, Duffield, and Schinckel (Hon. Sec.).

SOUTH-EASTERN CONFERENCE.—Arrangements in connection with Conference of South-Eastern Branches, to be held at Naracoorte on March 22, were dealt with. It was decided to hold morning, afternoon, and evening meetings, and to invite the Hon. Minister of Agriculture and officers of the Department to attend. Matters of detail were also settled.

Bagster, February 4.

INAUGURAL MEETING.

PRESENT—Messrs. Freeman (chair), Stiggants, C. and F. Brown, Basham, and Gravestocks (Hon. Sec.).

BUSINESS.—Matters in connection with the working of the Branch were dealt with. Mr. Thomas Freeman was appointed Chairman and Mr. E. A. Gravestocks Hon. Secretary. It was decided to meet on the Saturday nearest to full moon, and a programme for four months was adopted.

FORMALIN FOR PICKLING WHEAT.—Some discussion on this subject took place, and it was decided to obtain 1 cwt. of formalin for use of members, in order to test it against bluestone.

Millicent, February 2.

PRESENT—Messrs. Stewart (chair), Varcoe, Mutton, Oberlander, Davidson, McRostie, Holzgreffe, Magor, and Campbell (Hon. Sec.).

EXPORT OF CANNED EGGS.—The Hon. Secretary read letter from Mr. D. F. Laurie in reference to the question of exporting canned eggs to England.

HORSES DYING.—Discussion took place on losses of draught mares at foaling time: quite a number have died in this district. Mr. Holzgreffe thought that it would pay a smart young farmer to take a course in veterinary work, as, while the district could not support a veterinary surgeon, a capable young farmer with a knowledge of stock complaints and their treatment, could augment his income to a considerable extent. Mr. McRostie thought that if the grants to local Agricultural Societies were done away with, and the money used instead to cover the cost of sending qualified men into different districts, teaching the farmers how to deal with such troubles, the State would obtain more benefit from the expenditure. Members generally favoured Mr. Holzgreffe's suggestion.

SPARROW PEST.—Mr. Holzgreffe called attention to damage to cereal crops by sparrows, and urged that simultaneous action should be taken to poison them. He made it a practice to scatter good wheat in his garden for a week or two, and then substituted grain, poisoned with phosphorus, with very good results. Mr. McRostie said he noticed the sparrows flocked together in large numbers after the first rains, and thought that was the best time to deal with them. Mr. Stewart mentioned that he had seen a large flock of starlings—five hundred or more—in the vicinity of Rendelsham.

SPARROWBILL OATS.—Mr. Holzgreffe tabled samples of this grain. It was a very late variety, and coarse in the straw.

Gladstone, February 4.

PRESENT—Messrs. Brayley (chair), Rundle, Inglis, Greig, Odgers, Goode, and Wornum (Hon. Sec.).

FORMALIN FOR PICKLING WHEAT.—Messrs. Brayley and Wornum reported on experiments with formalin for pickling wheat. The former considered that the seed had been considerably injured by the pickle. Mr. Rundle read extract from *The Journal of Agriculture* dealing with the use of formalin.

CHANGE OF SEED.—Mr. Goode asked whether any real benefit resulted from a change of seed wheat. Mr. Brayley said he had been sowing seed of Purple Straw for seventeen years in succession, and but for rust last year he would have reaped a very good crop.

GRADING SEED WHEAT.—The Chairman and Mr. Goode strongly recommended the use of the grader for securing a good sample of seed wheat.

RED RUST ON MANURED LAND.—The statement made at Caltowie meeting that crops manured with phosphates were more liable to rust than unmanured crops was criticised, members being agreed that the phosphate assisted the wheat to mature earlier, and the plant was less liable to injury from the rust fungus.

Hawker, February 15.

PRESENT—Messrs. Wardle (chair), Schuppan, Cannell, Moller, O'Loughlin, Hirsch, Judell, and Smith (Hon. Sec.).

FORMALIN FOR BLACK RUST.—Reference was made to the heavy losses from disease known as black rust or leaf smut. The use of formalin as a preventive of the disease was discussed, and all members present indicated their intention of trying it this season.

Yorketown, February 11.

PRESENT—Messrs. Correll (chair), Corlett, Anderson, Jung, Koth, Domaschenz, and Newbold (Hon. Sec.).

FORMALIN FOR PICKLING WHEAT.—Most of the members experimented last year with this pickle, but in all except two cases the experiment was a costly failure, the crops being badly affected by smut. In each case Schering's formalin, as recommended by the Department of Agriculture, was asked for, but, on comparing notes, it was found that the two members whose experiments were a complete success obtained the formalin from Adelaide, whereas the others purchased their supplies locally. Members wished to know how they could be sure of purchasing formalin of proper strength, as in some cases there had been considerable financial loss through the use of an inferior article. [See reference in General Notes.—Ed.]

SALTBUSH ON SALT LAND.—Mr. Domaschenz stated that the annual saltbush, known locally as Victorian saltbush, had proved superior to the other varieties during the present dry summer. Despite the long spell without rain it made splendid growth on salt land, and was providing a good supply of green stuff for the cows.

Wilson, February 18.

PRESENT—Messrs. Harrison (chair), Crossman, Barnes, Nelson, Logan, Need, and Meyer, and one visitor.

DAIRYING.—Mr. Ward advocated dairying in combination with wheat-growing in the dry areas. Every farm should carry 10 to 30 milk cows. He advised the Shorthorn-Hereford cross for general purposes in this district. A separator should be kept, and the cream sent to a central factory. Some discussion followed. Several members held that while separated milk was better in the summer for calves than ordinary skimmed milk, there was no difference in the winter when both can be kept sweet.

Wilmington, February 15.

PRESENT—Messrs. Robertson (chair), Hannagan, McLeod, Zimmermann, Schuppan, Broadbent, and Payne (Hon. Sec.) and three visitors.

CURING HAMS AND BACON.—Mr. J. Schuppan read a paper on this subject. The first factor to success in this work is to kill the pigs at the proper season of the year. This must be in the cold season, as the hams must be thoroughly cooled, or they will not take the salt properly. His practice was to hang the meat out for one night, and if not sufficiently cold in the morning he put it out the second night. The hams should always be cut to nice shape. No rough edges, rags, or pieces only partly cut off should be left. For pickling he had two cases of solid wood made to hold the brine. One to hold the meat from one pig was 2 ft. 4 in. x 1 ft. 3 in. x 15 in., and the other 4 ft. 3 in. x 2 ft. 3 in. x 18 in.; this latter is sufficient for two pigs. The case should be made watertight by soaking it thoroughly. He then mixed sufficient salt with about one-twentieth of its weight of saltpetre. A thin layer was sprinkled on the bottom of the case, the hams first rubbed well with the mixture, and then packed with flesh side upwards. Plenty of the mixture was packed on top, especially about the exposed bone. The sides and flitches are similarly treated and packed in layers with flesh side upwards, except that the top layer is reversed. The sides and corners of the case are packed with pieces of pork, and then brine is added. He made the brine thick enough to float an egg; then, when it was quite cool, it was poured over the pork until it was just covered. The contents of the case should be turned over about once a week. The flitches of bacon should be left in pickle for two weeks, then taken out and immersed in fresh water for twelve hours, after which they should be hung up in the smokehouse. The hams should remain in pickle up to six weeks, and afterwards soaked in water for twenty-four hours. When taken out of the water the sides and hams should be laid on a table and the skin side rubbed with the hand to secure a soft surface free from wrinkles. They should then be hung in the smokehouse. If the smoke is regulated properly two or three days will suffice. Each must judge for himself when the meat is smoked sufficiently. He preferred to have it a brownish-yellow tint. For smoking he used only moist chips from the wood-heap, but care must be exercised that the chips only smoulder and do not burn brightly. He had followed this system of curing hams and bacon for many years, and the product always met with favour. He saw no necessity for the use of anything but salt and saltpetre for the pickle.

Koolunga, February 16.

PRESENT—Messrs. Butcher (chair), Button, Shipway, Cooper, Fuller, Jose, Hutchison, Sandow, Perrin, Buchanan, and Noack (Hon. Sec.).

CO-OPERATION.—Mr. T. B. Butcher read a paper on this subject, dealing with the many benefits that farmers would derive from the adoption of co-operative principles in their business. On every side they saw the benefits of co-operation, and he thought that farmers as a body could with advantage follow the example set by others in this matter. This not only applied to purchasing their requirements in bulk at reduced prices, but also in other matters affecting their interests. Co-operation in dealing with such pests as rabbits, sparrows, starlings, weeds, etc., was an essential factor to effective work; in fact, it was only by united action that they could be kept in check. Considerable discussion ensued, and the various directions in which farmers might co-operate with advantage—such as buying manures, bags, implements, etc.—were indicated. Some difference of opinion existed as to whether small local unions should be formed or if such business should be done through a central union.

RABBIT DESTRUCTION.—Rabbits are increasing in the district, and it will be necessary for landowners to give serious consideration to the question of their destruction. Members wished to know the best way to dissolve strychnine for mixing with pollard for poisoning rabbits. [We have no records on this matter. Perhaps some of our readers can answer the enquiry. It is open to question whether it is advisable to use strychnine for the purpose, owing to the danger of loss of life.—Ed.]

Balaklava, February 11.

PRESENT—Messrs. Robinson (chair), Anderson, Black, Neville, Spillane, Tuck, Thomas, Thompson, Goldney, and Burden (Hon. Sec.).

THE YEAR'S WORK ON THE FARM.—Mr. J. Spillane read a paper on this subject. The year's work may be said to commence with the preparation of the fallow for seeding operations. Seeding should not be commenced too early, as the weeds should be given a chance to start first. He would cultivate the fallow after the first rains, as that not only improves the tilth, but covers any seeds lying on the surface, and helps to secure their early germination. Before drilling he would cultivate again, and if any weeds are showing would also harrow the land. Seed should be drilled in about 1 in. deep. Directly seeding is finished, fallowing should be commenced, and pushed on to finish in August. Depth of ploughing must depend upon the character of the soil. He would keep the land harrowed up to the plough, and get the cultivator or scarifier to work to destroy the weeds. All working of the fallow should be done when the soil is moist. At haymaking the farmer must make the best use of his time, as a few days will carry the crop past the stage at which it will make good hay. For hay to be fed long he would cut as soon as the bloom is off, but for chaffing he liked a little corn in it. In selecting wheat to sow for hay he chose a solid-straw wheat. The hay should be well stacked as soon as possible, and he was satisfied that it would pay the farmer to thatch the stacks. He would build his stacks facing east and west, so that the narrower end was exposed to the quarter from which they got the most rain. In cutting open the stack, he would start at the east end, to lessen damage by rain. The farmer should have all his implements, etc., ready to commence harvesting as soon as the crop is ripe. The machines should be in good working order, or loss of time and grain will result. There was no question that the complete harvester had come to stay, and although many farmers objected to the loss of chaff for feed purposes, this could be overcome by cutting a portion of the crop early with the binder and threshing it after harvest. In fact, he thought this practice should be adopted in any case, as the farmer will have more feed for his stock, and have a better sample of wheat to sell. The crop left for grain should be stripped as quickly as possible after it is ready. The farmer should have a machine for each 100 acres to be reaped. Considerable discussion ensued, members generally agreeing with the writer.

Cherry Gardens, February 14.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Broadbent, Hicks, Brumby, Potter, Curnow, and Ricks (Hon. Sec.).

OLD WHEAT.—Mr. Jacobs tabled grains of wheat taken from thatch that had been on the roof of a house for fully forty years. The wheat was in a fairly good state of preservation, though somewhat discoloured.

DISEASES OF PIGS.—Mr. Jacobs read article from *The Journal* on diseases of pigs, which was much appreciated.

Mannum, February 11.

PRESENT—Messrs. Faehrmann (chair), Wilhelm, Pfeiffer, Dickson, Walker, Schultze, and Preiss (Hon. Sec.), and one visitor.

THE VERMIN QUESTION.—Members complained of great increase in rabbits throughout the district, and of the damage done by the pest. Settlers on the fringe of the unoccupied Crown lands find it impossible to grow any crops unless their holdings are wire-netted. It is the unanimous opinion of members of this Branch that in order to keep the rabbits under it will be necessary to have compulsory, simultaneous poisoning three times a year, viz., February, July, and October. Foxes were also reported to be increasing in the district, and it was resolved that this Branch invites other Branches to discuss the advisableness of passing a law compelling all District Councils to pay for fox scalps.

Kapunda, February 4.

PRESENT—Messrs. Sullivan (chair), Teagle, Kerin, Shannon, Weckert, Windebank, Harris, Vogt, Pascoe, Daly, and Holthouse (Hon. Sec.).

STANDARD BUSHEL.—Mr. G. Teagle read a paper dealing with the efforts made last year to secure a legal standard of 60 lb. for wheat. He stated that a petition with the signatures of over 350 farmers in favour of this was entrusted to a representative of a farming district, but he had neglected to present it to Parliament. This year the Chamber of Commerce had fixed the standard at 63 lb., and yet in New South Wales, with a 59½ lb. standard, the farmer got more for his wheat than did the South Australian farmer. It was providential that in such a dry year the farmers were able to market wheat weighing 63 lb. to the bushel, but should next season be at all dry those who marketed their wheat before the standard was fixed would be unfairly docked in price by the wheatbuyers unless it should happen that they can reach the high standard of this year. He thought they should ask that all in favour of asking Parliament to fix the standard at 60 lb. should send petitions to this Branch, when steps would be taken to secure that the matter should be brought before Parliament. Several of the members thought no good purpose would be served by continuing the agitation for a 60 lb. standard.

Onetree Hill, February 16.

PRESENT—Messrs. J. Bowman (chair), F. and G. Bowman, Blackham, Flower, Ifould, Kelly, Smith, Thomas, and Clucas (Hon. Sec.).

CATTLE EATING RAGS, ETC.—A member asked for advice as to treatment of cattle which had contracted the habit of swallowing rags, bones, and other refuse. It was stated that neglected calves acquired the habit, but members thought there was some natural craving which, unless otherwise satisfied, induced the habit. One member was satisfied that salt was a remedy, and instanced some cattle which, on being depastured on salt country, were cured of the habit. There would be less danger of the cattle picking up refuse if salt, sulphate of iron, and bonemeal were supplied regularly. Some quicklime might also be added, and the mixture placed in troughs where the cattle could help themselves.

POISONING RABBITS.—Members reported that throughout the district phosphorised pollard was being laid, apparently with good effect, as wherever one turned the odour of dead rabbits was very pronounced.

CONFERENCE AT GAWLER.—Members supported proposal of Reeve's Plains Branch to hold Bureau Conference at Gawler in March, and delegates were appointed to attend same.

Saddleworth, February 17.

PRESENT—Messrs. Frost (chair), Benger, Hannaford, J. H. and T. Eckermann, Frost, Klem, Scales, and Coleman (Hon. Sec.).

PROFIT IN POULTRY.—Mr. G. Benger read a short paper dealing with last year's experience with poultry. He had 60 hens in all, and they laid a total of 7,866 eggs, as under:—January, 26 dozen, value 19s. 6d.; February, 37½ dozen, value £1 14s. 4½d.; March, 67 dozen, value £3 7s.; April, 44 dozen, value £2 18s. 8d.; May, 35 dozen, value £2 9s. 7d.; June, 25 dozen, value £1 7s. 1d.; July, 19 dozen, value 17s. 5d.; August, 42 dozen, value £1 6s. 3d.; September, 118 dozen, value £2 16s. 6½d.; October, 103 dozen, value £2 7s. 2½d.; November, 90 dozen, value £1 19s. 4½d.; December, 49 dozen, value £1 3s. 5½d.; total return, £23 6s. 5½d. for eggs; and for young roosters, etc., sold, £2 3s. 7d. was received. In addition to the food they picked up about the farm the fowls received 12 bags of screenings, worth 7s. per bag, or a total cost of £4 4s., leaving a profit of £21 6s. 0½d. The fowls were simply the ordinary farm fowls, of no particular breed. Members considered the results satisfactory. Fowls kept in this way require the minimum of attention and keep, are very healthy, and lay well.

COST OF WHEAT GROWING.—The Hon. Secretary submitted an estimate of cost of growing wheat on fallow on his farm last year. This appears in another part of this issue.

HORSE—THE MOTIVE POWER ON FARM.—Mr. W. T. Frost read a paper on this subject, to the following effect:—If judicious care is exercised in breeding, trouble and risk may be avoided in breaking in the colt, more especially if as a foal he is carefully handled a little and domesticated, so that when fit to be broken in he can be easily caught. First, place on a good headstall, with ring in front of noseband; secure a rope in same, and pull him around from side to side. In a very short time he will learn to lead. Put a strong surcingle on. Mouth with a guttapercha bit; rein him slightly to one side for about 20 minutes; then remove sideline to the other side; reverse a few times. This will be sufficient mouthing to teach him to answer to the rein, after which he may be driven about the yard or paddock, and taught to stop and start when bid by his attendant, who should not ill-use or frighten him. He should be handled and spoken to kindly, but firmly. Handle him about the legs, and lift them; thus trouble may be avoided when he has to be shod. A quicker system is to put him in the off side wagon shafts. He had done this without any handling or mouthing. Put a quiet horse in near shafts; run the skid hard on; hook back chain; raise shafts, so that an attendant can lower same from inside of wagon by the kicking rope attached. When the colt is in position, lower shafts quietly, and secure tugs as soon as possible. He is now practically secure. Breeching, kicking rope, and belly-band are soon adjusted, and, with three good horses in the lead, away you can go. Always break with an open headstall. From the time the colt is taken in hand till broken in he should be stabled. Feeding, grooming, and handling will quiet him, and with good treatment an affinity between him and his attendant will grow up. The stable is the best place to teach discipline. Vicious colts may require sterner treatment; if very bad, by putting him down a few times he will soon submit, finding that struggling only adds to his discomfort. Before putting him in the team on the land he should know the stopping and starting terms. Short names should be used. In driving in the team, care should be taken to prevent them from closing, bumping, or treading on each other. Do not thrash them with the reins, as this punishes their mouths severely and worries them. They will carry their heads high, lose condition, and get sore shoulders. He was sure there was an enormous waste of motive power on most farms, through horses having their condition worried off them, instead of its being worked off. A steady team will keep their condition best. A tear-away horse should be got rid of as soon as possible.

Virginia, January 16.

PRESENT—Messrs. Hatcher (chair), Stremmel, Nash, Taylor, Huxtable, Baker, White, Thompson, Odgers, and eight visitors.

THE FARM OF THE FUTURE.—Mr. Hatcher read paper on this subject read at Port Pirie Branch by Mr. Teague, and a good discussion ensued.

FORMALIN FOR PICKLING WHEAT.—Two members reported that they had used formalin as a preventive of black rust, with satisfactory results. Members wished to know—(1) Why, if wheat is pickled with formalin and kept in bags for a few days it spoils, while if sown at once no injury results; and (2) why some wheats are less liable than others to black rust. [See reference in General Notes.—Ed.]

FEEDING HORSES.—In reply to question as to best chaff for horses, viz., that cut wet or dry, members were of opinion that it should be neither wet nor dry, but slightly damp.

Orroroo, February 8.

PRESENT—Messrs. Moody (chair), Brown, Lillecrapp, Oppermann, Dunn, Robertson, and Tapscott (Hon. Sec), and a number of visitors.

HOMESTEAD MEETING.—This meeting was held at Mr. T. H. P. Tapscott's residence, the garden, dairy, farm buildings, live stock, etc., being carefully inspected and favourably commented on. After the inspection the visitors were entertained by Mr. and Mrs. Tapscott, who were thanked for their kindness and complimented upon the success that had rewarded their efforts to make the homestead an object lesson to others.

Koppio, February 17.

PRESENT—Messrs. Swinburne (chair), Richardson, Howard, and Brenand (Hon. Sec.), and two visitors.

MANGELS.—Mr. R. Richardson read a paper on the cultivation of mangels. He thought mangels one of the best fodder crops they could grow in this district. It was true that they were gross feeders, and consequently needed very liberal manuring, and that there was a considerable amount of hand labour involved. Still, when the heavy crops that could be grown were taken into consideration, he thought it would pay to grow mangels in this district. The Long Red was, perhaps, the heaviest cropper, but the Yellow Globe was a good variety, while Golden Tankard was claimed to be the most nutritious. Mangels do best on rich alluvial flats. The land should be ploughed deeply, and thoroughly worked. Give a liberal dressing of farmyard manure, as well as manures such as nitrate of soda, kainit, and super or bonedust. A good dressing would be 1 cwt. of the first two and 2 cwt. of super or bonedust per acre. A little salt might also be used, as mangels do well on salty land. Last season he put in a small area of black land rather roughly, and was well satisfied with the result. He strongly recommended members to experiment with small areas on some of the black flats and moist gullies. Pigs do splendidly on mangels, and if given to cows in the dry summer months the milk yield will be considerably increased. A few acres of mangels would also be of great advantage for ewes to lamb early. Members were satisfied that mangels would pay to grow in this district, as the rainfall is satisfactory.

Davenport, January 19.

PRESENT—Messrs. Trembath (chair), Hewitson, Holdsworth, Bothwell, Kingham, and Lecky (Hon. Sec.).

APPLICATION OF MECHANICAL SCIENCE TO AGRICULTURE.—Mr. T. Hewitson read a paper on this subject to the following effect:—The familiar applications of scientific research in aid of the resources of nature are in:—1. The chemical analysis, treatment of, and fertilisation of soils. 2. The culture of seeds, plants, etc., for reproductive purposes, thus aiding Nature's processes of selection of the fittest. 3. The utilisation of by-products. 4. The application of mechanical science to practical farm work, resulting in—(a) Economy of time and labour; (b) greater efficiency, and consequently less waste of both energy and material. In this connection science has followed the lines of economic law. Land, as the source of wealth, has been rendered more productive. Labour, as the other great factor in wealth production, has been multiplied in efficiency and effect. He referred briefly to the application of mechanical science to everyday work in farm life. The St. Louis Exposition afforded the most recent and extensive opportunity for a comparison between agricultural processes, as many remember them. 30 years ago, and the methods of to-day. From seedtime to harvest, or, rather, from the first settlement of land under its natural conditions to the highly scientific culture point, there has been a marvellous revolution both in methods and ideals. Mullenising and the stumpjump plough in scrub lands, while an advance on primitive methods, left the problem of clearing heavily timbered land unsolved. Grubbing by manual labour was frequently done at a cost equal to the capital value of the land itself. The application of steam, horse, or other mechanical power, by means of a steel cable, capstan, and sweep, enables the operator to extract a tree stump like a dentist draws a tooth. With the introduction of the double-furrow plough, ploughing as a fine art ceased to exist, but from the old wooden plough to the double furrow was not an advance by any means so revolutionary or wonderful as that from the double-furrow plough to the eight-gang automobile plough, which, coupled to a motor, will do the work of eight men and 32 horses. The nauseous work of spreading farmyard manure by hand may be now done by the manure spreader—a revolving wheel, with iron teeth, attached to a wagon, and operated by the hauling power. It is unnecessary to dwell on the contrast between the tiring and ineffective method of broadcast sowing by hand and the present-day drill. It is probably in harvest operations, however, that the most marvellous advance has been made. Nothing is more characteristic of the age than the improvements effected in the slow and laborious contrivances which satisfied our ancestors for generations. From the sickle, scythe,

and flail, which many of them had used, to the complete harvester, is a pilgrimage of progress, paralleled only by that from the monkish copyist to the printing press. Yet they had all watched its evolutionary stages. First, the primitive reaper, necessitating binding by hand, then the reaper and binder, the steam thresher completing the harvesting; or the still more economical process (followed where crops are light and straw of little value) of the stripper and winnower. It is needless to review the controversy as to the effectiveness of the complete harvester. Like other labour-saving machinery its initial cost can only be recouped by its use on fairly extensive areas, and probably under favourable physical conditions. Hay, instead of being actually handled three or four times, is now picked up from the swathe by the gatherer, which is a revolving cylinder studded with iron teeth, which, travelling close to the ground, flings the hay upon an elevator belt, which carries it to the wagon. Arrived at the stack, the hay is picked up by mechanical appliances, and carried to any part of the stack required. In the application of power to farming operations, mechanical science, though by comparison so vastly advanced, is still in the experimental stage. Horsepower variously applied is still the commonest form, but waterpower, where available, and windpower are the cheapest forms. The latter power is likely to grow in favour if the compensating windmill (a recent invention) proves successful. By this it is claimed that a steady and uniform application of force is ensured. The oil engine will probably only mark a step in the march of progress from handpower to electricity. The Ivel agricultural motor has been applied to all agricultural work, moving or stationary. The model farm of the future will probably substitute the electric power house for the stable. Utilising the storage battery or harnessing the wind to the dynamo, the farmer will have at hand a ready slave, tireless as a giant, yet docile as a child, supplying light, heat, and every form of energy.

Gawler River, January 20.

PRESENT—Messrs. Dawkins (chair), Bray, Spencer, Winckel, Baldwin, H. and F. Roediger, Parker, Badcock, Hillier, and Leak (Hon. Sec.).

DISEASES OF WHEAT.—The Chairman gave a short address on this subject:—Most of the worst diseases of wheat are due to parasitic fungi. Red rust, smut, black rust or leaf smut, and takeall or root fail come under this heading. By the South Australian wheatgrower no disease is more dreaded than red rust, and in the past various remedies have been tried, but the results have been nil. Somewhere about 1883 Mr. Ward discovered a wheat that was practically rust-proof; a wheat with a brown chaff, a weak straw, and very hard to thresh; a wheat from which nearly all, if not all, their rust-resisting wheats have descended. Some of the chief characteristics of Ward's Prolific wheat are found in nearly all of its descendants. Some have brown chaff, others are easily laid, and many are hard to thresh. Of late years considerable attention has been given by Messrs. Farrer, Marshall, and others to the making and improvement of Australian wheats, and it is only by a continuation of selection and cross-fertilisation that the hope of wheatgrowers rests in combating red rust. With reference to smut, so small are the spores of smut that 4,000 of them in a row would not measure more than an inch. They lie unseen in the unevenness of the grain. They germinate about the same time as the grain, and grow within its host plant till the time comes to mature the grain, when the parasite uses the juice of the wheat plant for the production of countless spores, and instead of grain in the ear comes a dark powder like soot or smut. This disease is prevented by using a pickle, such as bluestone (sulphate of copper), and although the fungus lives through the application, when the spores germinate they find themselves in a medium that is fatal to them. Bunt or ball smut (stinking smut) is closely allied to the smut fungus, but in this case the grain is converted into a dark, greasy mass, with a foul, fish-like odour. The treatment is similar to that of smut. Bluestone is the most popular pickle, and about $\frac{1}{2}$ to $\frac{1}{4}$ lb. in two gallons of water to the bag of wheat should be used. The disease generally known as black rust has been identified as the true leaf smut. This takes the whole plant, and usually prevents it coming into ear. It has been discovered that by using formalin as a pickle it will destroy not only black rust, but also smut and bunt, and he thought it would only be a short time before it displaced bluestone altogether. Some are of the opinion that

it is unwise to pickle with formalin more than a day or two before sowing. Takeall is a fungus that grows in the roots of the wheat plant, causing it to die. It is worse in loose land, and soil worked dry, that lies hollow, develops root fail. Land affected with takeall should never be worked dry. A crop of oats should be grown, as the disease has very little effect on oats. Some discussion took place on the use of formalin. Mr. Roediger stated that since he used this as a pickle he had not seen any black rust in his crops. He noticed, however, that where the seed was pickled and left in the bags for a few days germination was seriously affected by the formalin. He would like to know if other farmers had experienced a similar result. [See reference in General Notes.—Ed.]

Mount Gambier, February 11.

PRESENT—Messrs. Pick (chair), Dow, Ruwoldt, Smith, Sassanowsky, Williams, Norman, Vorwerk, Wilson, Schlegel, and Collins (Hon Sec.).

BIRD PESTS.—Considerable discussion on this subject took place. Strong complaint was made of the heavy losses to cereal crops through the depredations of the sparrows. Mr. Ruwoldt stated that he destroyed thousands of sparrows at seeding time with poisoned grain. He mixed half a bushel of wheat with half an ounce of strychnine, and put it out on the land the day after the crop was sown; if put out later the sparrows were very suspicious of it. Others had used strychnine, phosphorus, sugar of lead, etc., and, while most reported heavy death roll after the first application, it was generally found that the birds did not touch it later on. It was resolved that it be a recommendation from this Branch to the Town Council and District Councils to combine to pay for sparrow heads and eggs, and that poisoned wheat should be supplied to ratepayers at cost price. It was stated that starlings were not numerous, and one or two members thought they were beneficial. The damage to orchards and cereal crops in other parts was mentioned by several members.

SOUTH-EASTERN CONDITIONS.—The Hon. Secretary tabled copies of bulletin by Professor Perkins, and some discussion ensued. Exception was taken to a number of statements, particularly to the figures showing that the area under cultivation had given a gross average return of £4 4s. 10d. per acre. One member suggested that Professor Perkins must have based these figures on the returns from Mr. Ruwoldt's farm. It was generally agreed that the statement was very misleading, the returns being greatly exaggerated.

Mallala, February 6.

PRESENT—Messrs. East (chair), Jenkins, Hancock, Marshman, Worden, Murphy, and Nevin (Hon. Sec.).

BUREAU CONFERENCE AT GAWLER.—A letter was received from Reeve's Plains Branch, suggesting the holding of a Conference of the Lower North Branches, at Gawler, during March. It was resolved that this Branch support the proposal.

SOCIAL SIDE OF FARM LIFE.—Mr. A. Marshman read a paper on this subject. Generally speaking, their fathers had a tendency to unduly restrict the social pleasures and desire for recreation of their sons. Most, of course, were pioneers, who were forced to practise thrift and economy in the extreme, and who had to labour incessantly. Farming under early conditions was made too much of a drudgery. Modern times had, however, witnessed the extensive use of labour-saving machinery, which had greatly improved the condition of the tiller of the soil. These and other factors permitted the farmer to devote more time to recreation and social intercourse and had greatly brightened his surroundings. An occasional holiday for a day's sport, or any other source of freedom from everyday cares, will invigorate and strengthen the mind. Athletics served admirably in promoting physical development, and the interchange of ideas in mutual converse would indirectly assist in the successful working of the farm. He admitted that in some cases these privileges were abused, but this did not justify them in condemning them. The farmers should fully realise their opportunities in the matter of social intercourse, and life on the farm would be considerably more attractive. In the main, the writer's views met with approval.

Golden Grove, February 16.

PRESENT—Messrs. Angove (chair), Milne, Maughan, Madigan, Mullett, N. J. and A. D. N. Robertson (Hon. Sec.), and one visitor.

CATTLE COMPLAINT.—The Hon. Secretary reported complaint in purebred Ayrshire cow. The cow was in splendid condition, in full milk, and until the day before she died there was nothing wrong with her. The symptoms of the complaint were stiffness across the hindquarters, frothing at mouth, and every now and then a discharge of clear liquid; breathing was very laboured, and the tongue was hanging out. The cow was dead within 24 hours of first sign of attack.

PIGBREEDING.—The Hon. Secretary read from *Stock and Station Journal* a short paper on this subject.

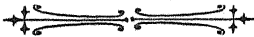
Carrieton, February 2.

PRESENT—Messrs. Gleeson (chair), Vater, Cogan, Kaerger, Steinke, Harrington, and Bock (Hon. Sec.), and two visitors.

HARVEST REPORTS.—Members reported on results of past harvest, which proved very unsatisfactory. Owing to the extreme dryness of the season several reported complete failure, while, with one exception, none averaged more than $1\frac{1}{2}$ bushels per acre. In addition to the drought, the ravages of rabbits and locusts contributed to the failure.

POISONING RABBITS.—This subject was discussed at length. Mr. Harrington had used various poisons, but found nothing so effective as phosphorised pollard. He dissolved the phosphorus in bisulphide of carbon, and, after adding the required quantity of water, mixed it with the pollard. One stick of phosphorus to 16 lb. of pollard was sufficient.

PICKLING WHEAT WITH FORMALIN.—Discussion on this subject took place, and the Hon. Secretary was instructed to write to the Department for full information. [Read *The Journal of Agriculture* for April, 1904, page 500, and January, 1905, page 312.—Ed.]



DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.		Date of Meeting.		BRANCH.		Date of Meeting.	
		Mar. 15	Apr. 19			Mar. 11	Apr. 8
Ardrossan	..	15	19	Meningie	..	11	8
Bagster	...	18	15	Millicent	..	2	6
Balaklava	..	11	8	Minlaton	..	11	8
Booleroo Centre	..	21	18	Morchard	..	18	15
Bowhill	..	17	1	Morphett Vale	..	21	—
Brinkworth	..	3	7	Mount Pleasant	..	3	—
Burra	..	18	15	Mount Remarkable	..	21	13
Cherry Gardens	..	14	11	Nantawarra	..	15	19
Clare	..	17	14	Naracoorte	..	11	8
Colton	..	4	1	Narridy	..	25	—
Crystal Brook	..	11	—	Norton's Summit	..	17	14
Eudunda	..	20	17	Onetree Hill	..	16	13
Finniss	..	6	3	Orroroo	..	10	14
Forest Range	..	16	13	Penola	..	11	8
Gawler River	..	17	14	Penong	..	18	15
Gladstone	..	4	1	Pine Forest	..	21	18
Golden Grove	..	16	20	Port Broughton	..	18	13
Gumeracha	..	20	17	Port Elliot	..	18	15
Hartley	..	17	—	Port Lincoln	..	18	22
Hawker	..	15	—	Port Pirie	..	18	15
Inkerman	..	21	18	Richman's Creek	..	20	17
Johnsburg	..	18	15	Riverton	..	18	15
Kanmantoo	..	17	14	Saddleworth	..	17	21
Kingscote	..	13	10	Stansbury	..	4	1
Kingston	..	25	29	Strathalbyn	..	20	17
Koolunga	..	16	13	Utera Plains	..	18	15
Koppio	..	16	20	Virginia	..	20	17
Longwood	..	—	22	Wandearah	..	20	17
Lucindale	..	18	—	Whyte-Yarcowie	..	18	15
Lyndoch	..	16	—	Willunga	..	4	1
Maitland	..	4	1	Wilmington	..	15	12
Mallala	..	6	3	Wilson	..	18	—
Mannum	..	17	—	Woolundunga	..	11	8



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

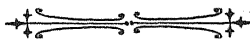
Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from January 30 to February 25, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	70	93	126
Masons and bricklayers	1	—	1
Carpenters	2	1	4
Plasterers	—	1	—
Painters	3	1	—
Fitters and turners	5	2	3
Blacksmiths and strikers	—	—	3
Boilermakers and assistants	1	2	1
Moulders	1	—	—
Brassfinishers	—	—	3
Enginedrivers	—	—	1
Cook	—	—	1
Compositors	1	—	—
Apprentices	15	2	5
Cleaners	3	12	—
Porters and junior porters	13	3	3
Rivet boys	1	—	1
Totals	116	117	152

February 27, 1905.

A. RICHARDSON, Bureau Clerk.



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OF SOUTH AUSTRALIA.

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RICHARD BUTLER,
Minister of Agriculture.

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GENERAL NOTES.

Agricultural Lectures.

During March a series of public lectures were delivered at Gawler, under the auspices of the Gawler Agricultural Society, by officers of the Department of Agriculture. These lectures generally were fairly well attended by farmers and others, and were greatly appreciated. The subjects dealt with are given below:—"The Production of Food by Plants and its Composition," by Mr. W. R. Jamieson, B.Sc.; "Foods and Feeding Stuffs in their Relation to Rations for Farm Stock," by Professor W. Angus; "The Farmer's Garden," by Mr. George Quinn; "Egg Production, Diseases of Poultry, etc.," by Mr. D. F. Laurie; "Common Ailments of Stock," by Veterinary Surgeon Desmond; "Fat Lambs for Market, and Woolclassing," by Mr. George Jeffrey; "Rearing and Feeding of Dairy Stock," by Mr. P. H. Suter. The lectures were delivered on the afternoons of Monday, Tuesday, Thursday, and Friday, March 20, 21, 23, and 24. After each lecture a number of questions were asked by members of the audience, and answered by the lecturer.

Nitrogen-gathering Bacteria.

Recently the Secretary for Agriculture has received several requests from farmers for a supply of the nitrogen-gathering bacteria about which so much has been written of late. Through the courtesy of the United States Department of Agriculture sufficient material has been received to enable tests to be made in South Australia on a small scale, but not sufficient to supply to applicants. Tests will be carried out under the direct supervision of the Professor of Agriculture, and should the results warrant it arrangements will be made to secure larger quantities of the bacteria. It is interesting to note that recently the New Zealand Department of Agriculture reports favourable results in its experiments with the preparation supplied by the American Department. There appears, however, to be some misapprehension as to the use and value of this preparation of nitrogen-gathering bacteria, some enquirers evidently thinking it can be used directly for the benefit of cereal crops. This, however, is not the case. These bacteria will only obtain nitrogen from the air when in contact with the roots of leguminous plants. On land naturally well supplied with nitrogen-gathering bacteria the increase in the crop as a result of the treatment of the seed is comparatively small, but on soils which otherwise would produce inferior crops of peas, beans, etc., the inoculation of the seed with the bacteria often has a very marked effect. Under such conditions the result is twofold: first the direct benefit to the pea or bean crop, and second to the succeeding cereal crop.

Flag Smut of Wheat.

For many years South Australian wheatgrowers have suffered more or less loss from a disease which has always been called "black rust." This disease does not appear to have ever been investigated in South Australia, but two years ago Mr. D. McAlpine, Vegetable Pathologist to the Victorian Department of Agriculture, announced that the disease was not black rust, but the flag smut of wheat. At the same time he stated that he had every reason to believe that by pickling the seed with formalin the spores of the fungus would be destroyed. Since then Mr. McAlpine has carried out several experiments, which have demonstrated the correctness of this forecast. In order to prevent confusion, it is intended in future in *The Journal* to refer to the disease under its proper name of "flag smut" instead of black rust.

Apples for February Shipments.

As a rule, the first three or four fruit-carrying boats obtain the best prices for their cargoes in London. This is undoubtedly South Australia's opportunity, and every effort should be made to secure a few good varieties, which will not only ripen between the first and last weeks in February, but will keep during the voyage to Europe. With this object in view, the gentlemen who have been appointed to assist Mr. Holtze in determining the commercial value of the fruits as they ripen at the Mylor State Orchard carefully scrutinised the specimens on view at the museum in the Botanic Garden. Although, unfortunately, no record had been made of the dates when the different varieties had been gathered from the trees, the committee saw about a couple of dozens of kinds which showed distinct promise in the direction indicated above. These have been noted, and their future careers will be carefully watched during the next year or two.

Applying Water to Fruit Trees.

The present is a critical time with fruit trees owing to the protracted period of drought through which we have passed. Apricots and peach trees which have finished their growth and fruiting for the year are already shedding leaves, and in most places water is not required to complete their bud ripening for next season. Apples and pears are somewhat similarly situated, but the present is a time demanding care with the citrus family. The cool, dewy nights prevent their wilting in the manner so noticeable about trees which become dry at the roots during midsummer, but the need for moisture may be just as pressing now. These trees are now bearing the strain of a crop which should be rapidly swelling in size and weight, and unless kept well supplied with moisture they are bound to gradually shed much fruit, or those which remain will become inferior in size and texture. The best test is to gauge the mois-

ture in the soil around the trees by opening small holes and satisfying the senses by both touch and vision. Young trees of all kinds not yet fully formed should be encouraged to grow as long as they can into the autumn, as their mission is to put on wood growth and not to develop fruit buds. In this climate such young trees as are already set into the orchard rarely suffer injury from the production of late growth.

Black Spot in Apples.

In this issue Mr. G. R. Laffer, the well-known fruitgrower, refers to the injury done to our apple industry by the export of fruit attacked by codlin moth caterpillars and by scab. Mr. Laffer's remarks on this matter deserve careful consideration on the part of both growers and exporters. In the March, 1905, issue of the *Cape Agricultural Journal* reference is made to the danger of introducing disease in the apples now being received from Australia. Although in South Australia we have proved that the fungus disease known as scab is easily controlled, it is not unlikely that the export of affected apples to the Cape may result in restrictive legislation and the hampering of our trade with South Africa.

Fruit and Orchard Inspection.

During March the Inspectors under the Vine, Fruit, and Vegetable Protection Act at Adelaide admitted 3,272 bushels of fruits and 41 packages of plants. While 12 packages of the latter were detained owing to the absence of the necessary declaration respecting the absence of the phylloxera from their place of origin, 259 bushels of over-ripe bananas were also destroyed. The exports to New South Wales, Queensland, and Victoria consisted of 12,376 bushels of fruits, 16 parcels of plants, and 2,901 packages of vegetables. Of these, 3,264 cases were grapes sent to these States. During the same time 2,931 bushels of apples and pears were certified as fit for oversea export to Europe and elsewhere. This was done by special arrangement with the shippers. During March Mr. Quinn has visited orchards at Mount Crawford, and lectured at Gawler in connection with his work of horticultural instruction. He has also visited orchards at Fulham, Grunthal, and Belair, in quest of suitable fruit to be forwarded to the Brisbane Fruit Show, to represent South Australian productions. Much of his time has, however, been occupied in connection with the inspection of fruit shipped to oversea ports by certain exporters who desire reports upon the condition of their produce at the time of shipment. Between February 28 and March 13, Inspector Kelly has paid 81 visits of inspection to orchards and gardens in the Clare district. This occupied six and a half days' active work. Mr. Kelly reports that the fruit crops are just about harvested, and, with the exception of one or two orchardists, the only persons who do not pay reasonable attention to the suppression of fruit pests are those who own a few trees of comparatively little value.

Apple Exports.

Telegrams from England report that South Australian apples are realising satisfactory prices. It is, however, to be regretted that the fears expressed in a previous issue that much of the fruit by the first boats was packed in an immature condition have been realised. In reporting on the fruit which arrived by the two February boats, London advices say that a number of varieties were immature, and inclined to wilt. This emphasises the necessity for endeavouring to secure one or more varieties of apples that will ripen during February and will carry to Europe. Such a variety would be of immense value to South Australia. Up to date this year South Australian exports show a considerable increase over exports to same date last season, but it is not expected that the total will quite equal last year's figures. In some quarters this is attributed to lack of available space owing to the operation of the Sea Carriage of Goods Act. That this is not the reason is, however, evidenced by the fact that one line of steamers offering to lift over 20,000 cases could not secure sufficient cargo to warrant sending their steamers to Port Adelaide.

ROSEWORTHY AGRICULTURAL COLLEGE PRIZE DAY.

On Tuesday, March 14, the presentation of prizes and diplomas took place at Roseworthy Agricultural College. The Hon. R. Butler, M.P. (Premier), presided, and the prizes were presented by Mrs. Butler. A number of visitors, including Mr. E. H. Coombe, M.P., Messrs. G. F. Cleland, J. W. Sandford, A. M. Dawkins, and A. Molineux (members of the Council of Agriculture), and the Secretary for Agriculture (Professor Angus) were present.

The following are the class lists and prizes:—

DIPLOMA EXAMINATIONS.

	Per Cent.	Marks.
Robert Wiese, of Mundalla	83.5
Clarence Golding Savage, of Burnside	73.8
Philip Henry Pickering, of Wilmington	70.9
Arthur Christian Jacobi, of Edwardstown	70.7
William John Naish, of Glenelg	67.6
Francis Thomas Cooper, of Kensington	63.6
Robert Hall Forman Macindoe, of Balaklava	61.2

Each of the above has been awarded the Diploma of the Agricultural College.

SPECIAL PRIZES, THIRD YEAR STUDENTS.

Gold medal, presented by Messrs. James Martin & Co., for highest aggregate in all subjects.

Robert Wiese.

Collège Second Prize.

Clarence Golding Savage.

Old Students' Cup, for best results in agriculture and veterinary science.

Robert Wiese.

Mr. B. Seppelt's prize for best results in viticulture, winemaking, and fruit culture.

Robert Wiese.

College prize for best outside work.

Robert Wiese.

SECOND YEAR STUDENTS' CLASS LIST

	Per Cent.	Marks.
J. A. B. Stevenson	...	85
J. Tassie	...	85
H. C. Wilson	...	84
R. C. Jacob	...	83
R. Wheaton	...	82
R. C. Pocock	...	81
A. W. Magarey	...	77
R. K. Lawrence	...	74
S. J. Bottrill	...	71
R. Martin	...	61
C. Leppinus	...	53

PRIZE LIST.

Silver Medal, for highest aggregate all subjects.

James Archibald Brakspear Stevenson.

College second prize.

John Tassie.

Mr. Büring's prize for highest marks in viticulture.

Harold Campfield Wilson.

College prize for best outside work.

Robert Wheaton.

Professor Perkins's prize for best farm notes.

Harold Campfield Wilson.

Professor Angus's prize for agriculture.

James Archibald Brakspear Stevenson.

FIRST YEAR STUDENTS' CLASS LIST.

	Per Cent.	Marks.
McLean	...	85
Baker	...	79
Robertson	...	74
Fairweather	...	74
Motteram	...	72
Donnell	...	69
Leishmann	...	68
Shand	...	65
Kay	...	62
Heath	...	61
Paterson	...	51
Yeatman	...	50
Aldridge	...	47
Spicer	...	38

Verco, Honey, and Bailey not classified.

PRIZE LIST.

Silver Medal, presented by A. L. Brunkhorst, Esq., for highest aggregate.

William Trail McLean.

College second prize.

Ralph Baker.

Bookkeeping prize, presented by J. S. Pringle Brooks, Esq.

William Trail McLean.

College prize for best outside work.

Loudoun Gibson Paterson.

Professor Perkins's prize for best farm notes.

William Rowland Fairweather.

Professor Angus's prize for agriculture.

William Leslie Roy Donnell.

Addresses were given by the Hon. Premier, by the Principal (Professor Perkins), and by Mr. Coombe, M.P.

DEFECTS IN EXPORT APPLES.

By GEORGE QUINN, Horticultural Instructor.

If our apples are to maintain the high position they have gained in the markets of Europe and other oversea places, only unblemished fruits of the very best quality must be shipped. The increased quantities now being poured into those markets will make the competition keener in the future than in the past, and patronage must eventually fall upon those who put forward the best article. The motto of our fruit exporters, therefore, should be: "Quality first; quantity afterwards." After the fruit is passed over the wharf here its safe carriage to Europe can only be fairly chargeable to the ship's officials when it is delivered to them in a perfectly sound condition, and it therefore becomes the duty of the grower and his agents to see that the produce up to this point is in a suitable state for transmission abroad.

In the June number of this journal last year I drew attention to the rotting of some apples which had been packed for shipment, and traced the immediate cause to the operations of the blue mould (*Penicillium glaucum*). Not having seen those fruits before they were in a collapsed condition I was unable to form anything like a clear conception of the initial stage of the defect, beyond that some had been burrowed by codlin moth caterpillars and that most of the damaged fruits belonged to the popular variety known as the Cleopatra or New York Pippin. Closer observations, however, have led me to believe that only an abnormal development of the pulp renders this apple open to the attacks of the mould fungi where no artificial abrasion of the skin has occurred. Those who have closely scrutinised the fruits of this variety can scarcely have failed to note the variableness of the outward forms assumed by them

even on one tree. Every shape, from flattened spherical to oblong, pear-main-like apples, is found. Among these some will be seen on which the so-called calyx lobes, composing what is technically known as the "eye," are set in a deep basin, the walls of which are irregularly convoluted. Among fruitmen these are sometimes very aptly described as "bull-nosed" fruits. With us, in this climate, "bull-nosed" specimens are more frequently found among those apples whose greatest diameter is lateral, and not from stalk to eye. In Tasmania, where this variety grows to greater proportions, the number of "hollow" specimens, I am informed, is greater, and more are affected by internal decay than with us. The primary cause of this defect is probably explained by a glance at the structural characters of a pomaceous fruit such as an apple. The pulpy portion we call "the fruit" is very clearly a swollen receptacle above which originally the blossom was borne. After the fertilisation of the ovules has taken place this receptacle swells, and gradually envelops the carpellary cells, in which the seeds are encased—and of which, in conjunction with such seeds, the true fruit is composed—with an ever-thickening series of layers of cellular tissue. This receptacle entirely encloses the fruit, and, with the exception of the sepals, and occasionally a few dried anthers, all that has persisted of what was at first visible is enveloped within the pulp. In a normally grown fruit a complete epidermal covering, commonly called the peel or skin, composed chiefly of cellulose, enwraps this receptacle or fruit, and protects its less hardy cellular tissue beneath. When the calyx end of the fleshy receptacle—which we call the apple—develops abnormally, the hardened walls of the tube (which formed that portion of the flower upon which the stamens grew) do not respond with equal growth, and the resulting pressure due to the rapid multiplication of cells in the surrounding tissue simply fractures its walls. This, in common terms, implies that the pulp which intervened between the bottom of the calyx tube and the seed or carpellary cavities is bursted, and a clear passage opened to the admission of putrefactive organisms, which, so to speak, are ever on the alert for such opportunities. While the spores of these may be carried in upon the bodies of insects which enter through such cavities, their entry is doubtlessly more often effected by their own peculiar powers. Specimens wherein not the slightest evidence of the presence or operations of any insect could be traced by microscopic examination were found to have long mycelial filaments traversing the most tiny apertures from calyx to core. Though unable to trace these back to their now defunct parent spore cells, one may reasonably assume that the spores were located without, and the filaments from them found an entrance as described above. As pointed out in a former article, these fungi do not require either light or much warmth—providing they are not actually frozen—to enable them to thrive, and consequently the temperatures maintained in the cool storage of a ship's insulated hold do not stay their activities and powers to decompose organic substances.

In Plate I. a comparison between the normal and abnormal types of the calyx cups will be readily detected. Fig. 1 shows the normal and regular basin, with slightly plaited walls, holding a calyx, the sepals of which are scarcely sunken below the general outline of the end of the fruit. In Figs. 2 and 3 the deeply lobed walls of the sunken, irregularly formed calyx basin are readily distinguished. A further view of these fruits in longitudinal section is shown in Plate II., where the internal formation and malformation resulting from these characters are more clearly visible. Fig. 1 shows the normal tube with a wall of tissue between its apex and the open seed cavities, thus obstructing the entry of mould fungi. Figs. 2 and 3 show the absence of this protective wall, and in Fig. 3 the discolouration consequent upon the decomposing action

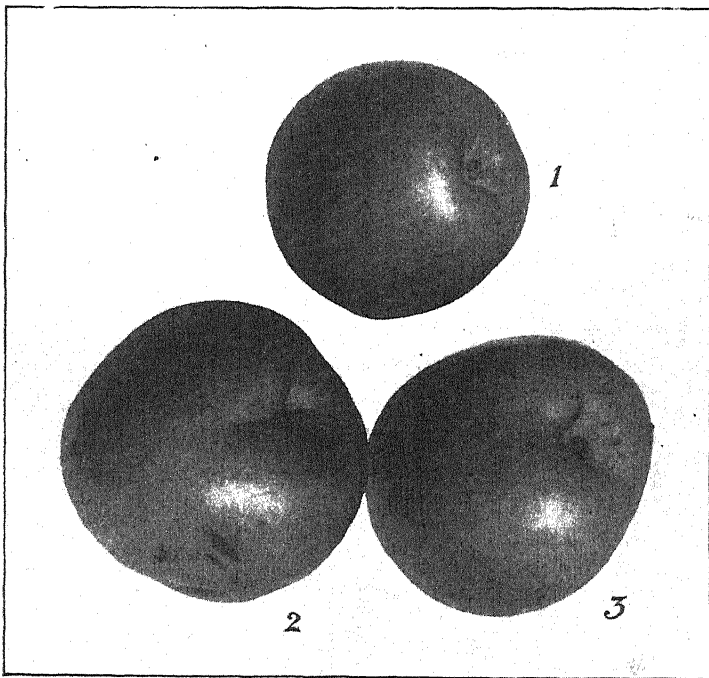


PLATE I.

Cleopatra Apples, showing at Fig. 1 the normal condition of the calyx, and at Figs. 2 and 3 the depressed calyx, indicating internal defectiveness.

of the fungi is noticeable. The mould which is almost invariably present doing this damage is the common blue one, *Penicillium glaucum*, but in occasional fruits the equally common Mucor, *M. mucedo*, is found. Although a speculative statement only, it is possible from the circumstances to consider that this Mucor does not begin the work of destruction so frequently as the *Penicillium*, but rather follows upon its ravages, and may even be partly parasitic upon the *Penicillium* itself. From

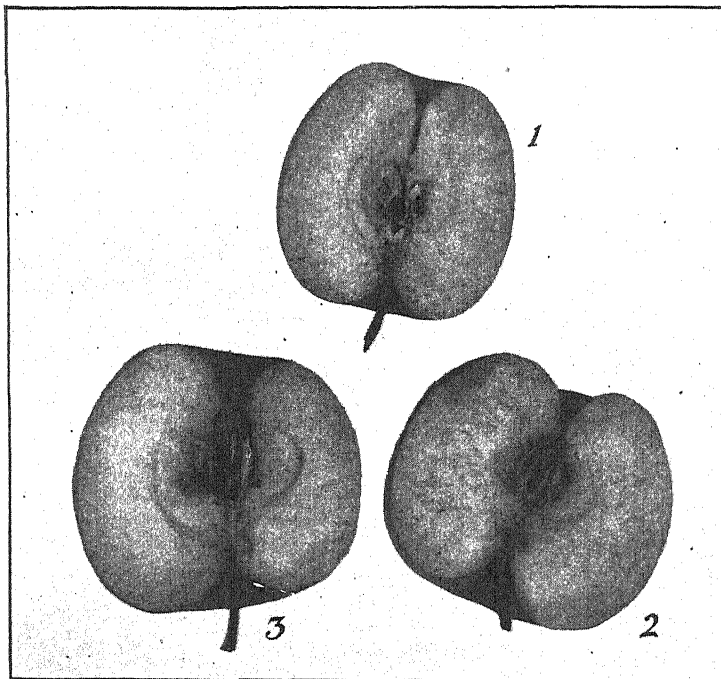


PLATE II.

The same fruits in longitudinal section, showing in Fig. 1 the position of the calyx tube in a normal specimen. In Fig. 2 the crumpled walls of the calyx basin, as well as the junction of calyx tube with the seed cavity. At Fig. 3 the same defects and resulting decay.

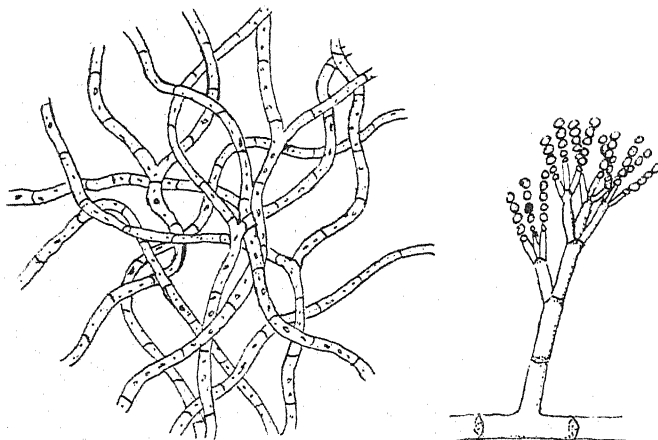


Fig. 1.

Fig. 2.

PLATE III.

THE BLUE MOULD (*Penicillium glaucum*).

Fig. 1, a semi-diagrammatic view of the branching, septate mycelial growths. Fig. 2, a spore-bearing hypha (*conidiophore*), arising from the same, with its terminal branches (*sterigmata*) constricted off into spores. The denseness of these produces the blue-green tint from which the name arises.

some former notes I have reproduced, in Plate III., a rough drawing showing the mycelial filaments and a spore-bearing hypha of *Penicillium* to indicate the differences between these two moulds. The mycelial strands are distinctly septate, *i.e.*, divided into sections by transverse walls, while in the *Mucor* the mycelia are composed of one branched, continuous cell growth. The aerial spore-bearing hypha (*Conidiophore*) of the *Penicillium* is septate and branched, and the spores are formed by constriction of the terminal branches (*sterigmata*) from the top downwards. The spores are thus naked and exposed. In *Mucor* the aerial hypha is not branched, and is non-septate until the ovoid top, known as the columella, is formed. Around this a pinhead-like knob (sporangium) is formed. It is a separate cell which encloses a mass of ellipsoidal spores which have formed within it. They are, therefore, protected by a covering until mature, and are also embedded in a mass of

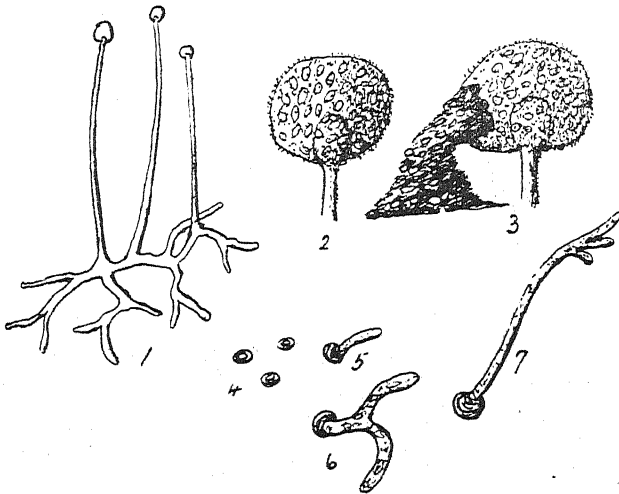


PLATE IV.

COMMON *MUCOR* (*Mucor mucedo*).

Semi-diagrammatic views of the asexual generation—Fig. 1, the branching, non-septate mycelium, with hyphae, each terminating in a knoblike sporangium. Fig. 2, sporangium, enclosing the spores; also the ovoid end of the hypha, known as the columella. Fig. 3, a sporangium ruptured, and discharging spores mingled with mucilaginous matter; the marginal dots on the sporangia represent spicules of calcium oxalate. Fig. 4, the spores of *Mucor*. Figs. 5, 6, and 7, various stages in the germination of the spores and the development of mycelia (after Jeffrey Parker).

mucilaginous matter. In Plate IV. some of the leading characteristics of the asexual generation of *Mucor mucedo* are outlined. The germination and growth of the spores, the mycelium, aerial hyphae, columella, and sporangium, both entire and bursted, are shown. The long germinating filaments which issue from the spores alike with *Penicillium* and *Mucor* show how they are peculiarly adapted for effecting an entrance into the tubes of the apples.

The practical lessons to be drawn from these may be briefly summed up as follows:—1. Do not pack up any fruits which have had their skins broken in the slightest, whether by finger-nails, insects, or any other cause. 2. Reject all specimens of Cleopatra apples showing sunken calyces and crumpled ends, characteristic of the so-called “bull-nosed” fruits. 3. Never permit any decaying fruits to lie about the packing or store rooms, whether in boxes or loose, but boil or burn them at once. 4. Build all fruit stores so that they may be readily made airtight, and before storing away the fruits fumigate the store with dense sulphur.

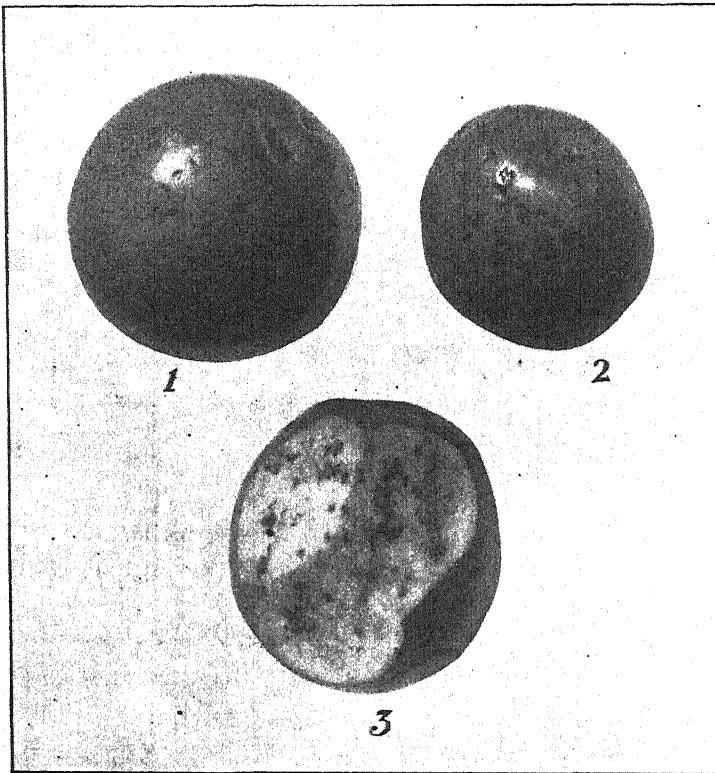


PLATE V.

Apples affected by the “bitter or brown pitting.” Fig. 1, showing first evidences externally. Fig. 2, a similarly affected fruit, after being packed for a fortnight. Fig. 3, section of a pitted apple, showing the more or less unconnected patches of pitting scattered throughout the pulp.

fumes for twenty-four hours at least. All wrapping papers and cases should, if possible, be subjected to a similar disinfection.

On Plate V. some of the external and internal evidences of the “brown,” or so-called “bitter pit” defect is figured. Fig. 1 shows it in a few sunken spots upon the skin. These have been much accentuated by

the camera, as to ordinary vision they were scarcely at all discoloured and only very slightly depressed in the original fruit. Fig. 2 is a similarly affected fruit after the expiration of a fortnight, and Fig. 3 shows three facet-like sections made through a fruit at the same stage as Fig. 2. In these sections the sub-surface pitting is very marked, and when the pulp is compared with the normal condition shown in Plate II. the contrast is great.

For further observations respecting this defect readers are referred to an article published in this journal for January of this year. All I

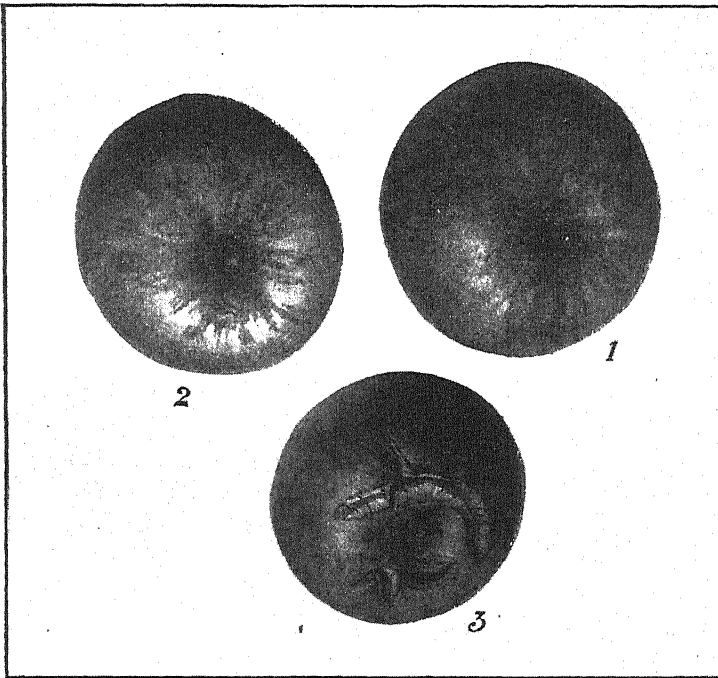


PLATE VI.

Dunn's Seedling Apple—Fig. 1, roughly russeted stalk cavity, characteristic of this apple when grown upon trees of mature age. Fig. 2, slight signs of cracking transversely across the russetting. Fig. 3, transverse cracking of a ruinous character.

wish to emphasize here is the absolute necessity for rejecting every apple which shows the slightest sign whatever of this pitting defect at the time of packing. The neglect to do this must inevitably lead to immediate loss and ultimate depreciation of, or even refusal to buy, all fruits liable to be affected.

Plate VI. shows at Fig. 1 the normal coarse, rough, russetting which appears to line the cavity of the stalk of the fruits of the variety known as Dunn's Seedling, more particularly as the trees become matur-

ed in growth. Fig. 2 shows slight cracks arising across the lines of this russetting, while Fig. 3 shows these in an aggravated and ruinous form. This coarse russet is formed of dead and modified layers of the epidermal cells. When subjected during the growing season to unusual atmospheric conditions, such as those caused by continued dryness or dampness, these injured or modified portions lose their vitality and powers of sympathetic action with the sub-layers. The pressure from within, due to the increase of cellular growth by intussusceptive means, *i.e.*, by the interposition of new particles among those already formed—causes these non-elastic russet spots to break asunder, and thus open the way to the intrusion of putrefactive organisms. The types represented in Figs. 1 and 2 may keep if not subjected to moist atmospheres, as the cracked portions harden into a cork-like layer which for a time resists the efforts of minute germs and the action of the gases of the atmosphere. The fruits injured after the manner of Fig. 3 should not be packed for export or stored out of view at home. In the insulated holds there is always the possibility of moisture condensing upon the fruits if the temperature of the air rises around them, and this means rapid deterioration to all such cracked specimens. Respecting the cause of the ordinary russetting, one is not in a position to speak, but it is possible that the caustic action of spray washes prepared with fresh limewater has much to do with the aggravated form which we see, particularly during seasons such as the present one, when the absence of rain showers allows full opportunities for such corrosive substances to operate.

ARE WE AS FRUITGROWERS GETTING THE BEST RESULTS FROM THE SPRAY PUMP?

By GEORGE R. LAFFER.

Any one conversant with the fruit industry will readily admit the benefits that have resulted from the use of the spray pump, but the question is: "Are we getting the best results?"

In order to deal more fully with this subject it will be necessary to trace the history of the movement. Early in 1890 it was almost impossible to grow clean apples and pears in the Adelaide Hills, and also at Angaston and other fruit centres, owing to the *fusicladium*, while shot-hole in apricots was so bad as to seriously menace the growing of that fruit. About 1892 several of our most progressive growers, largely aided by the advice of Mr. A. Molineux, started spraying with different mixtures, with the result that it was found that, when applied at the proper time, Bordeaux mixture largely controlled fungus diseases. It took some time, however, to determine when was the best time to spray. Now, so surely can these diseases be controlled that the grower having scabby fruit has only his own neglect to blame for his loss. There is still, however, a considerable amount of fruit affected with *fusicladium*

placed on the market every year. This is not suitable for export, and as each of the neighbouring States demands clean fruit, the aggregate loss to the growers is of serious importance.

Almost as soon as we had learnt how to master these fungus diseases the codlin moth appeared in our orchards, and proved to be a great scourge. It was a common thing for careful growers to lose quite half of their crop, and in many instances more than that. Three or four years ago the spray pump was again brought into use, with the object of controlling this pest, and although very definite and satisfactory results were obtained a large section of growers ridiculed the idea that the codlin moth could be controlled in this way; but even these have been compelled to modify their views, and many who formerly laughed at the advocates of spraying are now most emphatic in proclaiming its benefits. It is, however, to be regretted that many careless growers still neglect to spray for moth, or only spray at times and seasons that suit their convenience, consequently the results are not nearly as satisfactory as they should be. The consequent loss to the individual, as well as to the State, is much more serious than is generally supposed.

As most connected with the fruit industry know, this season a very large shortage of fruit has existed in several States as well as New Zealand. I do not think such good markets have been open to us for many years; but how have we taken advantage of these openings? True, much fruit has been exported, and it is equally true much more could have been sent away had it been clean. In pears this season we had the best crops on record. Duchess pears, or William's Bon Chretien, as they are known in some of the other States, have been a drug on the Adelaide market, selling as low as 2s. 6d. a case of 50 lb., and what they would have been worth had not canners and dryers operated it is difficult to say. The cause of this low price, I maintain, is the fact that buyers were afraid to operate for export, as when they did their consignments were wholly or partly condemned. Sydney was very short of fruit, and would have returned good prices for clean fruit. It is recorded that one large exporter sent a consignment on, and had another ready packed, when he received word that his previous lot had not stood the inspection. Rather than take the risk the second lot was sent out to the cannery, thus adding to an already glutted market.

It is safe to say that Western Australia condemned and burnt hundreds of cases, while others were shipped back to Melbourne, as importers knew they would not stand the test of inspection, which, while very strict, is perfectly fair. This market could only be touched by a few growers, who reaped the benefit of their care. Much of this rejected fruit was coming, not from the Hills gardens, but from places which were supposed to be fairly clean, and where splendid conditions exist for keeping them clean. One large grower and exporter, discussing this question with me, remarked:—"I can send my own pears to Western Australia and only lose an odd case: but when I buy fruit to ship I find a

large proportion are condemned." This state of affairs has been a serious loss to growers, and will have to be remedied if we are going to place pears successfully on the English and Continental markets. I am convinced that much of the failure in pear shipments to London is due to the fact that the fruit is not clean. Moth-affected fruit, especially pears, rarely keeps; pears ripen prematurely and go rotten, with the result that they affect not only that case, but any others stowed under them.

I have no hesitation in saying all this can be remedied by the proper use of the spray pump. Upon the application of the right mixtures at the right time will the success or otherwise of the operations depend. If spraying is followed up as it should be, with the one object in view, I feel confident from my own experience that we can save 95 per cent. and over of our crops. I am fully aware many growers contend that the moth is not so plentiful this year as usual, and that the hot, dry season is not favourable to them, but I would point out that previously it has always been contended that our dry conditions were particularly favourable, as proved by the several broods that have always been our main trouble. The dry weather was certainly a help to the grower who sprayed, as the poison remained on the trees for a longer period, and was consequently more effective.

The conditions in South Australia are particularly favourable for the growth of apples and pears, and whether we make the most of these advantages will depend largely upon the energy and intelligence of those engaged in fruitgrowing. The markets exist that will take our fruit, but it must be clean.

"JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,
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CIDERMAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 456.)

SMALL CIDER.

The object the foreigner has in view when making small cider is twofold. First, it enables him to make from the first juice cider of an extra fine quality, to put upon the market; and from the second juice, cider for home consumption. Sometimes the second extract is mixed with the original juice, where a large volume of only second quality cider is required. It has already been pointed out that the once extracted pomace still contains much juice; it is with the object of soaking out this juice that the pomace is treated with water and re-pressed. That the practice is worth carrying out may best be illustrated by quoting the average composition of the juice thus obtained.

Average percentage composition of five keeves of small cider: Sp. gr., 1.030; solids, 7.16; sugar, 5.66; acid, .28; tannin, .07.

As but little is known in England concerning the best conditions for producing small cider, experiments were made to determine the following points:—

- (a) What quantity of water should be added to the pomace?
- (b) Should the pomace be re-ground?
- (c) For how long and at what temperature should the pomace soak?
- (d) What substances should be added to the liquid obtained?

We will now consider these questions seriatim:—

(a) What quantity of water should be added to the pomace? The first experiment was to compare the results of using about one-half and one-third the volume of the original juice, while subsequent experiments were made with varying quantities.

The average composition of the small cider obtained was as follows:—

Using.	Sp. Gr.	Solids	Sugar.	Acid.
50 gallons of water $\frac{1}{2}$ original volume ...	1.0280	6.56	5.39	.28
36 " " $\frac{3}{4}$ " " ...	1.0335	7.94	6.25	.30
25 " " $\frac{1}{4}$ " " ...	1.0336	8.10	6.41	.36

The results of all the experiments, taking everything into consideration, indicated that one-half the volume of original juice was the best quantity of water to use for re-soaking the pomace.

(b) Should the pomace be re-ground? Experiments were made first by re-grinding the pomace before soaking. This was found to be a tedious task at best, and the attempt was sometimes futile. It was found, however, comparatively easy to re-grind the pomace after it had

been soaked with water. Experiments were then made to compare the result of this re-grinding after soaking as against merely soaking. So far as could be judged from the experiments made, the advantage of re-grinding was so small as not to compensate for the extra time and labour it involved.

(c) For how long and at what temperature should the pomace soak? In attempting to answer this question, the results of the preceding experiments were taken as a guide, so that the pomace was always treated with a volume of water equal to one-half the original volume of juice, and was not re-ground. The results indicated that the pomace ought to soak for at least 24 hours. Next as to temperature. Experiments were made at the ordinary temperature, and at the temperature produced by adding nearly boiling water to the pomace. The whole mass was thus raised to a temperature varying in different experiments from 117° to 120° F., and during the 24 hours' soaking it would fall in temperature to 100° F. The use of warm water had the undoubtedly beneficial effect of producing a richer juice than was obtained by the same volume of cold water. It also brought about other changes. When some of the small cider made with cold water was heated in a test-tube, a bulky precipitate was formed, apparently of some albuminous substance, which separated out on heating, leaving a clear juice. When the extract made with hot water was similarly heated, very little precipitate was formed. Tannic acid also caused a precipitate in the cold-made juice, which it did not produce in the juice extracted by hot water. Owing to the higher temperature of the latter, fermentation starts readily, and proceeds rapidly; but very little clarification takes place in keeving. Fermentation never commences so soon, nor proceeds so rapidly, in the cold-made "small" juice as in the ordinary apple juice, and it is therefore well to pump such small juice into keeves containing the lees of some pure juice which has just been drawn from the keeve. The juice obtained with cold water is very thick, and as fermentation proceeds in the keeve a similar result is produced to that in a test-tube on heating. An abundant head rises, sometimes even 6 inches thick, and a voluminous deposit is formed. In removing this head, and when racking from the deposit, there is, of course, much loss of juice. But if these operations are carried out with care the resulting juice ferments more slowly, and can be subsequently treated with even greater ease than the hot extracted juice. This was well shown in some experiments carried out in a subsequent year, to further determine the relative merits of extracting the pomace with warm or cold water. The results were considerably influenced by the warm temperature of the season. The pomace extracted with water at 120° F. yielded a juice having an average temperature of 66° F., while that extracted with cold water had an average temperature of 52° F. The result was a far too rapid fermentation in the warm-made juice, which did not occur in a cold season. The juice extracted with warm water

contained more solid matter than that extracted with cold water. The specific gravity of the warm-extracted juice was 1.035, and that of the cold 1.031. Two months afterwards the former had fermented down to 1.001, the latter only to 1.017, showing that much greater care is needed in the manipulation of the hot-extracted juice, especially in a hot season. Summarising these experiments, it would appear that hot extraction is the better from a chemical point of view; but it can only be carried out in a very cold season. In a warm season cold extraction is better, because fermentation is more under control.

(d) What substances should be added to this liquid? When the liquid has been keeved and becomes partly clarified it is racked into barrels. It will have been noticed from the analysis that this small cider is deficient in both sugar and tannin. To remedy the former defect is easy, and in the majority of the experiments about 5 per cent. of pure cane sugar was added to the juice. Further experiments were made to ascertain whether there was any substance as good as, or better than, pure cane sugar for adding to the juice to bring up its gravity. Two substances had been suggested as likely to prove of value, one used by brewers and called "saccharum," and the other "sugar candy"; the results proved conclusively that neither of these produced so good a small cider as pure cane sugar. Experiments have also been made to ascertain the effect of adding different quantities of tannin. Speaking generally, there is no question that the addition of tannic acid (British Pharmacopœia) has proved beneficial. Half a pound of tannin to 1,000 lb. of juice (about two hogsheads) has given the best result. In connection with the use of tannin, it is necessary to point out that while the addition of tannin to the cold-made small cider causes it to clear; in other words, the tannin acts as a precipitating agent, and does not remain in the juice; when added to the hot-made small cider, it does not cause any precipitation, but remains in solution in the juice. Therefore, the quantity of tannin employed must depend partly on the way in which the small cider is made. It is doubtful whether it would be profitable to employ sufficient tannin to clear the cold-made juice, and yet to leave enough in solution to give the desired astringency, and in such case it must be added after clarification has taken place.

Small cider when carefully made is an excellent drink produced at but little expense and trouble, and, in my opinion, capable of infinite improvement if properly studied in the future.

EARLY-MADE CIDER.

To secure from the very first windfalls, and from the juice of the first cheeses, a beverage very slightly, if at all, inferior to the general make, is a result that but a few years ago would have been considered unattainable. It is now, however, possible. Owing to the traditional belief that early-made cider is never good, very little attention was paid to this cider for the first few years of the observations; in fact, the in-

vestigations were seldom started until after it had been made. In 1899 some data regarding this early-made cider were obtained which were surprising. The average specific gravity of the juice was found to be no less than 1.065, hence it contained more sugar than the average juice of the season. Owing to the preconceived notion that this early juice was of no use, it had been allowed to ferment at its own sweet will and had been neglected. I could see no reason why, if this juice had been properly attended to, it should not have made excellent cider.

This idea about the uselessness of the first juice reminds me of a somewhat similar erroneous notion which was prevalent among Cheddar cheesemakers, viz., that in the early spring good cheese could not be made. I have shown that this difficulty was due simply to the absence of that warmth in the dairy which is natural in the summer, and that by artificial heat the difficulty can be overcome. It seemed to me, therefore, highly probable that an analogous natural cause had given rise to the popular belief that the first apple juice produces poor cider. And undoubtedly this is the case. Cidermaking is commenced too early. The temperature at such period is generally sufficient to cause very rapid fermentation. Sufficient attention is not subsequently given to the juice, owing to all interest being concentrated upon the grinding and pressing of the main crop of apples, and by the time this work is finished fermentation in the first-obtained juice has gone too far, and the cider is ruined. That there is anything in the juice which prohibits the production of good cider I could not believe.

In 1900 particular attention was therefore paid to the early-made cider, that is, the juice extracted from the first apples coming in, which are mainly windfalls. The specific gravity of the juice of these apples was again found to be comparatively high. The following are the gravities in 1899 and 1900 of the juice from the first five cheeses put up.

SPECIFIC GRAVITY OF EARLY-MADE CIDER

		1899.	1900.
First cheese	...	1.065	1.058
Second cheese	...	1.066	1.060
Third cheese	...	1.065	1.062
Fourth cheese	...	1.065	1.062
Fifth cheese	...	1.065	1.063
Average	...	1.065	1.061
Average for season		1.061	1.059

It will be seen that in both years the gravity of this juice was higher than that of the aggregate juice of the season.

In 1900 the juice was pressed out and keeved on the 15th-17th October, the temperature being rather high, ranging from 50° to 57° F.; fermentation proceeded rapidly. The first head was a characteristic brown head, and the second mainly brown. When racked into barrels the gravity had fallen to between 1.047 to 1.057. In the barrels fer-

mentation still continued with unusual vigour, so that on 1st November the cider was racked. On the 5th it was again racked, and on the 14th and 15th it was filtered. Filtration was difficult, and the filtered juice was not so clear as could be desired. The gravities of the filtered ciders were 1.018, 1.019, 1.017, 1.012, and 1.017. It will be seen that only one month elapsed between making and filtering the juice, which gives some idea of the rapidity of fermentation.

I am convinced that failure in the past to make good cider from the early-gathered fruit is due to this rapid fermentation, and that the difficulty may be overcome by attention and care. This cider, two months after filtration, had a gravity only .003 below its gravity when filtered. The cider with the highest gravity was excellent, as good as any made at a later period of the year: three of the other cheeses produced good cider, far better than any early cider ever before made at Butleigh; but one barrel contained cider which was certainly poor as compared with the others. It is noteworthy that this was the cider of lowest specific gravity. These results strikingly confirmed the lessons of previous years, viz., that a slow fermentation, which is not allowed to proceed too far, produces the best cider.

Thus the great difficulty with early-made cider is the rapidity with which the apple juice ferments. To check this fermentation must be the primary consideration of the cidemaker. It can only be done by racking at the right moment. Having taken the specific gravity of the juice when placed in the fermenting barrel, write this down with chalk on the barrel, or in a book kept for the purpose. In the course of a week or less again test the gravity, and write this down, with the date, on the barrel. This must be done frequently. The fall in gravity will show the rate of fermentation, and indicate when each barrel should be racked. For example, in 1901, when the specific gravity of the first extracted juice fell to 1.044 it was racked. When it had fallen to 1.037 it was again racked, and racked again for the third time on 5th November, when the gravity was 1.033. The juice was filtered on the 9th January, because the gravity was then 1.022, so that the liquid contained 4 per cent. of alcohol, and as the cider was not intended for bottling, it was stored in casks well bunged down.

As an indication of the progress and value which this saving of the early juice represents, it may be interesting to compare the results recently obtained with those obtained in the past.

In 1897, out of 50 barrels of cider made during the season, no record whatever was kept of the first 11. It was never expected to make out of the windfalls anything but cider for the farm, and cider for the farm was not much studied. But even at Butleigh cider for the farm is very superior to the general farm product, which is more like vinegar than cider. In 1898, out of 70 barrels made, the first 12 were not attended to.

In 1899 I began to pay attention to this early-made cider, but did

not recognise its peculiarity to be rapid in fermentation until too late to make much improvement that season; consequently, the cider when filtered had a gravity of only 1.007, which was far too low. In 1900 still further improvement was made; the cider was filtered with an average gravity of 1.015, and, while nearly all of it was good, some of it was excellent. In 1901 the whole of the first-made cider was kept completely under control, and filtration was postponed until each barrel was ready, and the resulting liquid was in no way inferior to the later-made cider. Thus it will be seen that the early-made cider, which may be said to represent from 15 to 25 per cent. of the total cutput, according to the season, instead of being neglected and relegated to the farm hands as hitherto, can be, and at Bunleigh has been, converted into a beverage in no way inferior to the remainder of the output.

(To be continued.)

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, Superintendent of Vineyard.

Our anticipations of a small vintage were more than borne out by the final result. A start was made on February 27, and in five days we completed picking. Many of the plots, notably Shiraz, yielded only one-quarter of the amount gathered last year. Some of these plots suffered severely from frost in the spring, so the dry season is not altogether to blame. The total yield amounted to about 18 tons, as against 39 tons last year, and the total amount of wine made was 2,500 gallons, as compared with 5,400 gallons in 1904. Thus our vintage was at the most only one-third of what we might reasonably have expected.

The starlings accounted for some tons of grapes, for they entirely stripped 20 acres of young vineyard which was carrying a fair crop. This, as well as the damage done to older parts of the vineyard, would amount to a considerable quantity. The vintage weather was ideal, with fairly warm, clear days and cold nights.

Though vintage proper did not take long, the whole operation was somewhat prolonged by the leaching of the skins after pressing. This is the second year we have used the system at the College, and, on the whole, benefiting by past experience, the result was highly satisfactory. From 4 tons of pressed skins we filled nine tanks, and obtained from this 200 gallons of liquid, with a strength of 10 per cent. absolute alcohol, or 17½ per cent. proof. Next year we hope to improve the system in many ways, making the extraction easier and cheaper.

The season still remains remarkably dry, and vines and trees are suffering severely from the want of moisture.

PACKING OF BUTTER FOR EXPORT MARKETS.

By P. H. SUTER, Dairy Expert.

During the export season just completed I have on many occasions had to draw the attention of factory managers to the very unsatisfactory packing of the butter, and am pleased to note there has been a general improvement. There is, however, still room for improvement in the general get-up of some of the packages. In every shipment examined I have found it necessary to draw the attention of some shippers to one or more of the following unsightly defects, viz., bad finish on surface of butter; smeary, greasy paper; dirty paper; dirty cases; discoloured and uneven colour of wood used. Another very serious fault is short weight of butter. When packing butter, care should be taken to use cases which are made from thoroughly seasoned New Zealand pine, for if green, unseasoned timber is used it will result in green mould (*Penicillium glaucum*) being formed on the paper next the butter, and also on the outer surface of the butter, which will result in lower prices being secured for the produce.

The factory brand and trade mark should be neatly impressed into the wood at each end of the box, this being best done by the box manufacturers. There is nothing more unsightly than the smudged ink brands which are put on in some factories. If the paper is moist in packing the ink finds its way on to it, and gives the package a most uninviting appearance. Prior to packing the butter in the cases I would strongly recommend packers to steam them, but not the lids, for they will warp. Allow the boxes to thoroughly air and dry, then paint the whole of the inside surface with pure, refined paraffine wax. This is of immense advantage in preventing the tainting of the butter from the wood. When opened up the butter will be much fresher on edges and surface. The paraffine, when pure and free from kerosine, possesses no smell, and will not in any way affect the butter. It is by no means expensive, nor is any costly plant required for applying it to the cases; in fact, the cost per box will not exceed one penny, which sinks into insignificance when we consider the many advantages to be gained. New Zealand factories are largely using it, both for butter and cheese, and speak highly of it, so also does the Dairy Expert for Victoria (Mr. Crowe).

When placing the paper in the boxes prior to packing, it is well to draw it through a solution of preservative and salt, taking, say, a pannikin of the salt and preservative mixture added to the butter, and mix it with a bucket of good, clear, pure water. When placing the paper in the box, see that it is put in neatly, so that no wood is exposed to the butter, and that sufficient paper is left overlapping to allow of its drawing up squarely over the surface of the butter when full. Before filling in the butter drain the box of any moisture which may be present, place it upon the scales, and mark the weight of box or tare on the corner.

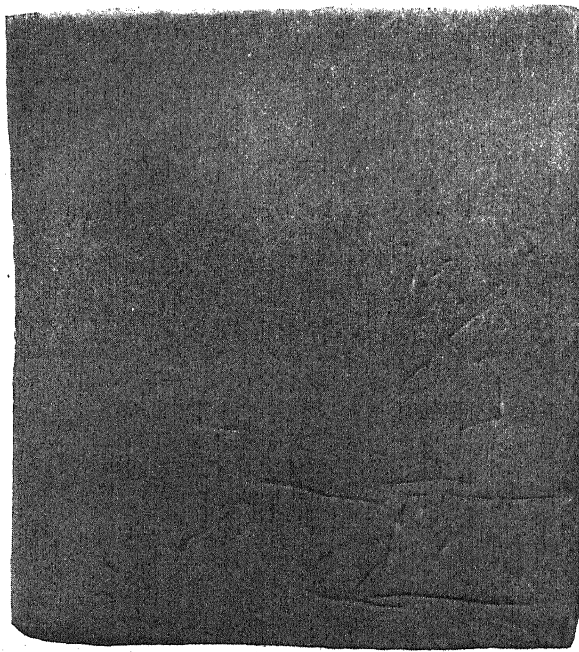


Fig. 1.
Well-packed, full-weight cases, showing slight wrinkles on surface of butter, caused by the paper.

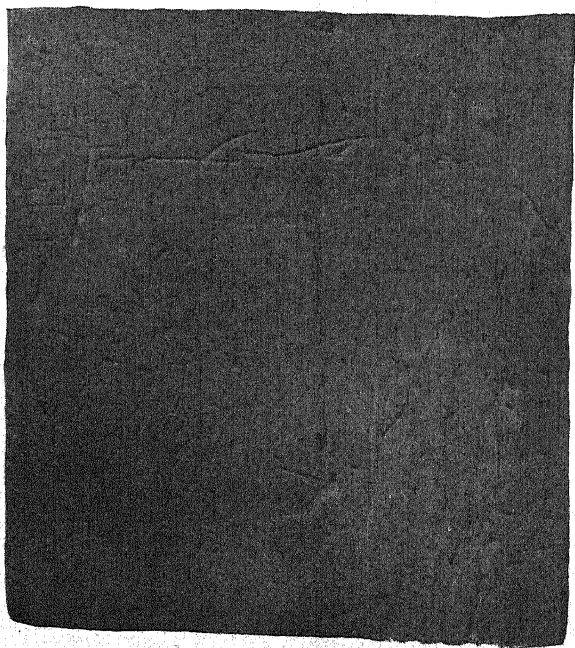


Fig. 2.
Well-packed, full-weight cases, showing slight wrinkles on surface of butter, caused by the paper.



Fig. 3.
Fig. 3 weighed 57 lb. net; Fig. 4, 53½ lb.



Fig. 4.
Badly-packed cases, showing air spaces, etc.

When filling the box do not place too much butter in at one time; usually 10 lb. is sufficient. Great care should be taken to secure a thorough ramming of the butter into the corners, to allow of no air spaces, such as exist in the package as shown in Figs. 3 and 4. Where such air spaces exist we get decomposition and the creation of moulds, which interfere with the keeping quality and flavours of our butters. Compare these illustrations with well-packed cases, shown in Figs. 1 and 2.

After filling the box place it on the scales, levelling off the surface, leaving 56½ lb. net weight. Where the butter has had two workings—which I strongly recommend for all export butters—this weight is ample. If, on the other hand, only one working of the butter has been given, and the butter is to be packed straight away, then 57 lb. net should be left in each case, for there will be more moisture, and consequently more shrinkage during transit. Having placed sufficient butter in the case (to ensure its bringing the lever of the scales down in London, when tested for weight), carefully level off the surface, but in doing so do not work it too much, as this will give the butter a greasy appearance, which takes away much from its appearance and value in buyers' eyes. Finally, place the export brand neatly upon the surface of the butter, trim off all rough edges, and wipe off any butter adhering to the paper, for if this is left it is strong evidence of carelessness existing at the factory, and has a prejudicial effect on buyers. Pull up the paper tightly at ends and sides, and see they meet neatly and squarely in the centre. Having done this, place a well-fitting piece of paper over the other paper, and nail down a neat-fitting lid, carefully wipe the bottom of the case, and place away in the cool room, which should possess a sweet atmosphere. Stack the cases to allow of circulation of cold air around them, the colder the room the better. The packages of butter, when ready for market, should present a neat, clean, and tidy appearance, for it is important to cater as well for the eye as the palate of the buyers.

I must appeal to managers to be more careful in their packing, and especially to aim at uniformity in weights. If we are continually forwarding short and irregular weights it means a serious loss to the producer, or suppliers to the factories, and, further, the reputation of the State suffers. There is no excuse for this state of things; it is either the result of gross carelessness or a desire to rob the buyers. The buyers in England and other countries are not so simple as many evidently imagine. When they buy a consignment of butter they take every care to see they are not defrauded. Irregularity of weights in Australian butter has led, and not before its time, to certain rules being set down by buyers. With New Zealand butters little, if any, complaint now exists as to weights. I understand each box of butter bears the weight of butter contained, and is stamped and certified to by the Government.

In *The Australian Pastoralists' Review* some interesting information concerning the sale of butter in England was published recently. With Australian butters certain rules are applied. One is that 10 per cent. of

the bulk of the butter be weighed, if required by the buyer or seller, but in the case of hot weather not more than 5 per cent. be taken; usually however, three or four cases only are tested. If any of them go over 56 lb. good, that surplus goes to the buyer, in accordance with a rule which says:—"Overweights in packages of uniform market rates can neither be included in the average nor charged for." Under-weight cases come under the following rule:—"Packages of butter containing net weight of more than 30 lb. and up to 60 lb., to be weighed to half a pound." The way this works out is as follows:—Let a package of butter be but a fraction of an ounce under 56 lb., the weight to be paid for under the rule is 55½ lb. only. If the package contains 58 lb., no allowance for extra weight is made. The following instance, which actually occurred recently, illustrates very forcibly how the seller may suffer:—Three cases of bulk butter were taken from a consignment and weighed. The first two averaged 58 lb. of butter, but the third contained only 55½ lb. Under the rules quoted the buyer not only paid nothing for the extra weight in the first two boxes, but he was entitled to deduct half a pound weight for every third box in the consignment. In other words, this particular factory lost the value of 1½ lb. of butter on every box in the consignment. I have often found up to 59 lb. of butter per case in the South Australian shipments that I have tested. This was needless waste. If the box is painted with paraffine wax and lined with good stout paper, and the butter has been well worked, half a pound over is quite sufficient. At the same time, however, "under weight" must be avoided, and in this connection it may be advisable to point out that the beam scales are used in the butter warehouses in England, and the rule of the home and foreign exchange is that the package must bring the beam down. An absolute balance would be considered as "underweight," and, as weights are only calculated to the half-pound, an allowance would be claimed by the buyer.

UTILITY AND SHOW POINTS IN POULTRY.

By D. F. LAURIE.

The majority of poultry breeders have a strong leaning towards prize-winning, or exhibition poultry. Many breeders, whose chief aim is the production of eggs or table poultry for market, in time make their appearance as exhibitors at poultry shows. Certain people think that external beauty and perfection of form and feather cannot be associated with those money-producing qualities which please the commercial poultry breeder. It is, however, urged by those who are better informed as to facts that such ideas are mistaken, and that when utility strains lack the points laid down in the standard, or when exhibition birds fail in the utilitarian attributes for which the breed in question was once famous, a common cause may be assigned, viz., faulty methods in mating and

breeding. One cannot disguise the fact that many prominent breeders have ignored (and are still doing so) the economic qualities of certain breeds. English writers blame those whom they term "faddist judges." A faddist judge may or may not have a solid foundation in his knowledge of the breeds he professes to judge: more often than not he is really incompetent. The effect of some judging tends in the direction of altering some point or points, which, when accomplished, may have a disastrous effect upon the future of the breed. It is an axiom in breeding that if you unduly develop a certain part, or even quality, it is at the expense of the remainder. You can improve the standard of a breed, but that is a different matter. More than one breed has been injured, perhaps for a time ruined, by undue development of leg and too close approximation to a type utterly foreign to the original type. It is exceedingly easy for an expert breeder to completely alter the shape, and also many of the important points, in a few generations: such are more easily accomplished, and in a much shorter time than was the case even ten years ago. The thin end of the wedge once inserted is rarely withdrawn. We may take, for example, the Langshan, which, when introduced by Major Croad in 1870, was a bird of medium length of leg, fine white skin and flesh, a most prolific layer, and a grand table bird. For many years the breed made but little progress in the estimation of poultry fanciers, but at length certain breeders took the Langshan in hand, and proceeded to improve it to such an extent that utility breeders now have little to say in its favour. Long years ago excessive selection, with the view of producing extraordinarily large white faces and ear lobes in the old White-faced Spanish fowl so affected the breed that it is but a memory as regards any utility qualities. This bird is generally held up as the typical "horrible example."

If the progress of any breed, new or old, be carefully noted, specimens appear from time to time which stand out from the rank and file of the birds exhibited in the class, and are awarded prizes. Very often the real reason for the apparent superiority lies in the fact that such specimens have been more carefully prepared for exhibition than the other exhibit. It may happen that, where medium length of leg has hitherto been a cardinal point, one of these exhibits may be taller, and the judge at once commends a fault, and proclaims the bird "stylish," or some such term. Exhibitors note this, and, feeling that such "stylish" birds must be bred in future, set about the same with disastrous results, for, as a rule, these faults accumulate.

Undue development of head points is another direction in which we may look for harm rather than good. There are too many interpretations of the standard owing to the use of flexible terms. Taking Minorcas and Leghorns, we find that the comb should be large. That is, of course, an elastic term, but it really means that a large comb is characteristic of the breed, as distinct from certain other breeds. No definite dimensions could be laid down, because good birds vary considerably in

size, and what might be fair proportions for one bird would not suit another. The tendency has been towards undue development of comb, wattle, etc., to an extent which has seriously affected the fecundity of these breeds, and it is a matter of common knowledge that most stud Minorca and Leghorn cocks have to be dubbed before mating up in the breeding pen. The American judges and breeders have always discouraged the undue development of these points in their exhibition stock. In the past I have frequently refused to notice a bird which I considered was developed to the verge of monstrosity in such or any other direction.

In England, where the scope is immense as compared with Australia, the breeders send birds to different shows to suit the fads of the judges—at least, those who are known to be consistent. Such matters as these have had a bad effect in separating the exhibition from the utility bird. I may, however, point out that there is almost as much danger in neglecting the standard in favour of the utility points as in the previous cases. Those who have considered the matter are aware that of all domestic stock the fowl is most prone to variation and reversion to a former type. Reversion in this case means a return to a type which was not so perfect as the modern one.

There are not many intermediate stages between the modern domestic fowl and the jungle fowl. It is quite true that the Langshan, the Old English Game, Dorking, and Malay are wonderfully prepotent, and show but little tendency to reversion. The more modern breeds, however, are very often of composite origin, and there are always influences at work which must be counteracted by selection on the part of the breeder. I have always pointed out that certain breeds and their varieties are prized for certain utility qualities, and that the birds which received the specific name of the breed were to be distinguished by certain points (miscalled "fancy"). These are the points which distinguish the varieties of a species—in the natural state they are due to food, climate, and various causes, the effects of which have been long in accumulating. In domestic poultry similar results have produced local breeds, while in other cases the hand of man, in the form of the experimental breeder, has produced the variation, and in due course fixed it. If we allow these distinguishing points (even if they are external) to become less accentuated, or perhaps obliterated, it stands to reason that we are permitting an alteration in type which, while no immediate effect may be noticed, must in time end in disaster; briefly, we are encouraging reversion to a mongrel type.

To breed entirely for egg production, without any regard for type, must end badly, for it is hardly likely that a breeder would be indifferent to typical points, and yet sufficiently expert to mate his stock to such advantage as to counteract the evil effects alluded to. With the single exception of the Langshan, I know of no local type of fowl that has been developed on such lines that is of any marked value or is greatly

superior to the average run. To quote instances of Continental breeds, such as Houdans, La Bresse, Campines, and others, we find that the local breeders have very decided views on the chief characteristics which they maintain in a rough-and-ready manner. It is, however, very reassuring to know there is ample proof of the truth of the contentions of many writers, viz., that birds of high utility and fit for exhibition in keen competition can be produced from the same matings. Where the matings are scientific and the care and attention thorough, such results will be obtained in every class of stock. If lack of stamina and weakened constitution are associated with perfection of exhibition points it is obvious that, unless those points are so developed as to really exceed fair limits, the fault is in the breeding, feeding, and general attention bestowed. Well-advised breeders will severely refrain from using stud stock which are known to be unsound and of poor constitution. The tendency of modern methods is to perpetuate many strains or families which are unsound, and which, under more rigorous conditions, would not have survived. Such stock, bred, as is too often the case, amidst insanitary surroundings, may attain adult age, but are actually unfit to produce progeny of any value; they perpetuate their enfeebled kind. Rigorous selection should be the watchword of the breeder. To improve the utility and exhibition points by careful selection in breeding must be the end in view. This can only be attained by close attention to constitution in the first place, and rational feeding and attention later on. The ordinary fowl has, as a rule, been allowed to roam at large, and through a process of "roughing it" gained, perhaps, in constitution; more probable the fact that it was not taken in hand by inexperienced breeders tended to freedom from disease. On the other hand, the purebred bird has been pampered and neglected alternately in many cases. Fed on overstimulating foods, and forced to live amid insanitary surroundings, the constitution has been impaired, and such defects gather in transmission. The common fowl if sick is generally allowed to die, and there is an end of it. The diseased bird which cost pounds is nursed back to convalescence, and afterwards used in the breeding pen. There are few poultry diseases which do not unfit those attacked for subsequent use as stock birds. Time will convince breeders of this fact.

It has long been in my mind to detail the foregoing, because for many years pure stock has suffered unmerited abuse. We have a number of expert breeders at work, and there is an ever-growing body of less experienced enthusiasts in whose interest these reflections are penned. Keen attention to breeding and an accurate knowledge of pedigree are essential to success. The utility man may question the value of pedigree, but pedigree is really the hallmark of utility. The names of noted sires and dams are the culminating points of excellence. To know that your laying stock on both sides is bred from known good layers for several generations is a guarantee that you will have a large percentage of excellent layers among your pullets, and also that if you continue on

proper lines you will increase the percentage of good layers. To breed from an unknown stock is to work in the dark. No earnest worker has time for such aimless experiments. Finally, I hope that all breeders will study exhibition stock. The mere fact that close attention to small details is necessary is proof that the power of observation must be highly cultivated, and we know that the observant man is better equipped for the battle of life than he who goes through life seeing only a small part of the details, and that vaguely and indistinctly.

ANALYSES OF FERTILISERS.

The following results of analyses of samples of fertilisers taken by the Inspector of Fertilisers during the past three months are published for general information. In each case the certificate of constituents or guarantee registered by the vendor is shown in brackets, thus—(36 per cent.)—immediately before the results of the analyses:—

ELDER, SMITH, & Co., LIMITED.—Lawes' Superphosphate—Water-soluble phosphate (37 per cent.), 38 per cent., 38·6 per cent., 36·5 per cent., 38 per cent.

ELDER, SMITH, & Co., LIMITED.—Elder Superphosphate—Water-soluble phosphate (37 per cent.), 34·9 per cent.

CLUTTERBUCK BROTHERS.—Elder Superphosphate—Water-soluble phosphate (37 per cent.), 38·9 per cent., 38·6 per cent., 37·1 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 38·6 per cent., 39·8 per cent., 39·6 per cent.; citrate-soluble phosphate (2 per cent.), not tested; acid-soluble phosphate (6·5 per cent.), not tested.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Guano Superphosphate—Water-soluble phosphate (25 per cent.), 32·2 per cent., 33·8 per cent.; citrate-soluble phosphate (5 per cent.), 4·7 per cent., 2·8 per cent.; acid-soluble phosphate (3 per cent.), 3·2 per cent.

GEORGE WILLS & Co.—United Alkali Co. Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 38·5 per cent.

GEORGE WILLS & Co.—Concentrated Superphosphate—Water-soluble phosphate (90 per cent.), 93·6 per cent.; citrate-soluble phosphate (8 per cent.), 6·4 per cent.

D. & J. FOWLER, LIMITED.—Albatross Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 37·3 per cent.

D. & J. FOWLER, LIMITED.—Lion Brand Superphosphate—Water-soluble phosphate (36 per cent.), 45·6 per cent.

D. & J. FOWLER, LIMITED.—Lion Brand Superphosphate—Water-soluble phosphate (39 per cent.), 45·8 per cent.

WALLAROO PHOSPHATE Co.—Mineral Superphosphate—Water-soluble phosphate (36 per cent.), 39 per cent., 39·5 per cent.

NORMAN & Co.—Reliance Superphosphate—Water-soluble phosphate (34 per cent.), 36·8 per cent., 36·3 per cent.; acid-soluble phosphate (3 per cent.), not tested.

AUSTRALASIAN IMPLEMENT Co., LIMITED.—Farmers' Favourite Fertiliser—Water-soluble phosphate (36 per cent.), 38·9 per cent., 36·2 per cent., 37·7 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Wheat Manure—Nitrogen (1·05 per cent.), 0·9 per cent., 0·75 per cent.; water-soluble phosphate (28·1 per cent.), 29·1 per cent., 31·7 per cent.; citrate-soluble phosphate (5·9 per cent.), 6·8 per cent., 6 per cent.; acid-soluble phosphate (6 per cent.), 8·2 per cent., 6·2 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Bone Superphosphate—Nitrogen (1·6 per cent.), 1·4 per cent., 2 per cent.; water-soluble phosphate (15·2 per cent.), 27·4 per cent., 20·4 per cent.; citrate-soluble phosphate (15·8 per cent.), 10·9 per cent.; acid-soluble phosphate (6·8 per cent.), 13 per cent.

S.A. FARMERS' CO-OPERATIVE UNION.—Black Horse Superphosphate—Water-soluble phosphate (36 per cent.), 37 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—S.A. Superphosphate—Water-soluble phosphate (32 per cent.), 37·1 per cent.; citrate-soluble phosphate (2 per cent.), 2·4 per cent.; acid-soluble phosphate (6 per cent.), not tested.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Bone Manure—Nitrogen (3·5 per cent.), 3·6 per cent.; acid-soluble phosphate (30·5 per cent.), 39 per cent.

EXCELSIOR MANURE Co.—Bone Manure—Nitrogen (2 per cent.), 3 per cent.; acid-soluble phosphate (30 per cent.), 32·2 per cent.

EXCELSIOR MANURE Co.—Bonedust—Nitrogen (3·25 per cent.), 3·5 per cent.; acid-soluble phosphate (44 per cent.), 45·2 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Bonedust—Nitrogen (2·5 per cent.), 3·1 per cent., 4·1 per cent.; acid-soluble phosphate (45 per cent.), 50 per cent., 44 per cent.

L. CONRAD.—Bonedust—Nitrogen (3·6 per cent.), 2·9 per cent.; acid-soluble phosphate (43·6 per cent.), 48·6 per cent.

NORMAN & Co.—Reliance Thomas Phosphate—Acid-soluble phosphate (30 per cent.), 28·4 per cent.

GEORGE WILLS & Co.—H. & E. Albert's Thomas Phosphate—Citrate-soluble phosphate (24 per cent.), 26·2 per cent.; acid-soluble phosphate (6 per cent.), 7·5 per cent.

AUSTRALASIAN IMPLEMENT Co., LIMITED.—Thomas Phosphate—Acid-soluble phosphate (29 per cent.), 30·8 per cent.

POTATO MANURING EXPERIMENTS.

By W. L. SUMMERS.

Last October, at the request of the Department of Agriculture, Mr. Henry Curtis, of Piccadilly, near Mount Lofty, undertook a small experiment in the manuring of potatoes. Mr. Curtis's garden is situated in a gully at the back of Mount Lofty, and is fairly typical of the market garden land of that locality. The soil consists of a good black sandy loam of considerable depth, with here and there a patch overlying a gravel run and somewhat drier than the rest of the land.

The following were the conditions under which the experiment was carried out:—Land to be as even as possible in character; previous cropping for at least twelve months to have been the same over the whole area occupied by the plots; all the plots to receive the same treatment throughout except in the matter of the manures applied; all plots to be planted at same time, and with the same variety of potato. Plots to be one square chain in area, and paths 3 ft. wide between each.

Medium-sized setts of the Up-to-Date potato were used for the test. The land was well worked prior to planting, which was done about the middle of October. The previous crop on the block was the same variety of potato. The following table shows results of the experiment, the crop being lifted in February:—

Results of Manuring Potatoes.

No. of Plot	Manure Applied per Acre.	Yield per Acre.	Increase in Yield over Unmanured Plot.	Cost of Manure per Acre.	Cost per cwt. of increase due to Manures.
		Tons.cwts.	Tons.cwts.	£ s. d.	s. d.
1 {	8 cwt. Mineral Super ... 2 cwt. SulphateAmmonia 2 cwt. Sulphate Potash...	{ 9 5	— 15	4 7 0	5 9 $\frac{3}{8}$
2 {	820 lbs. Bonedust ... 1 cwt. SulphateAmmonia 2 cwt. Sulphate Potash..	{ 10 10	2 0	4 9 0	2 2 $\frac{7}{10}$
3	No Manure ...	8 10	—	—	—
4 {	8 cwt. Mineral Super ... 2 cwt. SulphateAmmonia	{ 10 10	2 0	2 19 0	1 5 $\frac{7}{10}$
5 {	820 lbs. Bonedust ... 1 cwt. SulphateAmmonia	{ 11 10	3 0	3 1 0	1 0 $\frac{1}{2}$

In planning the experiments care was taken to apply the same quantity of nitrogen and phosphoric acid in the four manured plots. The object of the experiment was mainly to test:—(1) The comparative merits of mineral super and bonedust as a source of phosphoric acid; and (2) the effect of the addition of sulphate of potash.

The season turned out remarkably dry. Up to the end of December practically no rain fell on the land after the potatoes were planted, and the total fall from planting to digging was only about two inches. It was necessary, about the middle of December, to irrigate the portions of the plots which crossed the gravel run, as the plants were beginning to show the need for water, and later on the whole area of the plots was irrigated. The extreme season and the very high yield of the unmanured plot make any comparison of results difficult. The small increase shown in Plot 1 is surprising. In such a dry season the more soluble phosphate might have been expected to have done better. At present value of potatoes the plot shows a profit, but under average conditions the reverse would have been the case. It will be noticed that the plots receiving potash yielded less than the corresponding plots without potash. This result surprised Mr. Curtis and myself, as, judging from the foliage and general appearance, the potash plots on December 21 promised better, if anything, than the other plots. In reporting on results, Mr. Curtis says that, having watched the growth on each plot very closely, he is satisfied, notwithstanding the results, that in this locality the potato crops require to be manured with potash.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, March 8, there being present—Colonel Rowell, C.B. (Chairman), Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, A. M. Dawkins, J. Miller, B. Basedow, R. Caldwell, J. Hill, R. Marshall, and G. F. Cleland.

The Secretary for Agriculture intimated that the Hon. Minister had decided to have a Bill to consolidate the Vermin Destruction Acts prepared and introduced into Parliament early next session. He would be pleased to receive suggestions as to where the present Acts could be improved.

The Hon. Minister intimated that Mr. T. E. Yelland had tendered his resignation as a member of the Council on account of his inability to attend meetings, and that the resignation had been accepted by Executive Council. Regret was expressed at the necessity for Mr. Yelland's resignation, and the Chairman was asked to convey to Mr. Yelland the thanks of the members for his services in the past.

On the motion of Mr. Marshall, approval was given to the formation of a Branch at Sutherlands, with the following gentlemen as members, viz.:—Messrs. A. M. Twartz, J. F. G. Kernick, E. Schiller, C. Nitschke, C. H. Carter, F. Snell, B. Thiele, C. Strange, and H. J. Dart.

The Secretary Murray Bridge Branch advised that it had been decided to close the Branch on account of difficulty experienced in securing regular attendance of members.

The following gentlemen were approved as members of the under-mentioned Branches:—Kapunda, Messrs. C. B. Domeyer, J. H. Pascoe, J. P. Daly, Peter Kerin, and A. W. Fawcett; Gladstone, Mr. W. Growden; Port Pirie, Mr. J. W. Hannaford; Kingston, Messrs. D. McBain, W. England, G. Barnett, and R. Jackson; Port Broughton, Mr. W. Tonkin; Mundoora, Messrs. A. E. Arbon and R. Gardiner; Balaklava, Mr. N. Reuter; Gawler River, Mr. James Hayman; Davenport, Mr. N. A. Richardson; Hartley, Mr. A. Wells; Appila-Yarrowie, Mr. W. H. Wait; Reeves Plains, Mr. Shepherd; Arden Vale, Messrs. G. H. Williss, M. Searle, J. Semmens, H. Klingberg, F. Lehmann, A. Pradel, and P. Hannemann; Eudunda, Mr. P. Sieber; Penong, Mr. J. M. Edwards; Mannum, Messrs. W. Busch, R. T. Scott, A. Kowald, J. Pine, and F. Lahne.

Mr. Caldwell read extracts from letter from Mr. B. Judkins, in reference to the superiority of South Australian conditions generally to those of California, and some discussion took place on the question of developing a market in Great Britain for South Australian honey. Mr. Sandford said his firm had made a strong but futile effort to open up the trade. For some reason our honey did not meet with approval; in some quarters there was said to be a flavour of eucalyptus. Apart from this, however, there was no question that prime English honey was quite distinct in flavour from South Australian, but it was a matter of the taste of the individual as to which was the better. He was satisfied that South Australian honey was quite equal to, if not superior to, that produced in the neighbouring States, and if a trade with Europe could be opened up it would mean a great deal to our apiarists. On the motion of Mr. Caldwell, it was resolved—"That the attention of the Hon. Minister of Agriculture be directed to the desirableness of ascertaining through the Agent-General exactly what flavour in South Australian honey is objectionable to the taste of the British consumer, with a view to assisting in the development of an export trade in honey."

Mr. Laffer called attention to the fact that no meeting had been called of the committee appointed on the recommendation of the Council to assist the Director in determining the commercial value of the fruits at Mylor Typical Orchard. They had practically lost a year in this important work. While a lot of public money had been spent on the orchard he was satisfied that this money would have been well spent if in the collection of apples they could find two or three good early export varieties, and in the pears secure better sorts than now grown. The Chairman and other members agreed with Mr. Laffer, and it was resolved that the Hon. Minister be asked to take the necessary steps to at once call together the committee to meet the Director of the Typical Orchard.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on April 1, 1905:—

With the exception of a few sultry days, the weather during the month just concluded was most pleasant; but, unfortunately, rain has persistently held off for such a lengthy period that water-carting now is general in the farming districts, even in some of the parts where shortage in this direction is seldom known. Feed has also become scarcer, and the outlook would, indeed, be serious, only that at this time of the year the seasonable rains may any day set in.

COMMERCE.—It was scarcely to be expected that an equal volume of business would be put through as in the months immediately preceding March. However, merchants have had very little to complain of, the turnover being substantial, whilst country buying orders were quite up to expectations. In the city the general tone of trade was healthy. Satisfactory reports are to hand of the much improved position at Broken Hill, several of the big mines being now in full operation; and, as the Metal market is again firm, prospects there are certainly favourable.

BREADSTUFFS.—Cable advices from London report the European Wheat markets as very dull; the causes are mentioned as being, heavy shipments and far better harvest prospects in America. It is doubtful if a South Australian cargo could be sold at 32/- per quarter c.i.f., U.K., for orders; while Victorian cargoes are valued at about 3d. less, and New South Wales at lower money still. The chief transactions during March took place in Victoria, where very large sales were made to shippers on the basis of about 3/4 per bushel f.o.b. In this State farmers are holding firmly on to their Wheat, and the total business reported is very small indeed. Most of the ships chartered have been loaded, and it is difficult to see where any advance in value can come from. Flour has found buyers for home consumption to a limited extent, but shipments have been few and far between, so that millers' stocks are fairly heavy, and there is little disposition on their part to buy Wheat. The market in Fodder lines has not responded to the drought conditions, Chaff finding only a few enquiries from Sydney, and then only for prime green samples, while the local trade has been of a very ordinary character. Offal has been in very strong demand, no doubt caused by the long stretch of dry weather which we have experienced. A small parcel of Bran and Pollard has been imported from New South Wales, and further lots are stated to be following. Prices, there, however, are advancing, which would bring the c.i.f. to a parity with values here. Feeding Grains.—Farmers are inclined to hold on to their stocks at present rates, the general impression being that an advance is imminent. In Cape Barley a fair turnover was experienced, but this mostly for seeding purposes.

POTATOES.—In our South-Eastern potato country excessive moisture is frequently the trouble growers have to combat; but this season the opposite conditions prevail—result, the yield of the early crop of the tuber is undoubtedly light, and South Australia would have had to import heavily only that the acreage planted was fairly extensive. Values were disturbed owing to lower rates offering from the East, and with direct shipment from Tasmania being quoted at a considerable reduction, to meet this competition, "Gambiers" had to come back to about 30/- per ton. Onions.—As predicted in our former, prices have well sustained, and the outlook points to certainly no reduction on present quotations.

DAIRY PRODUCE.—The markets throughout the Commonwealth have been considerably affected owing to the far-reaching effects of this dry spell, and even in Victoria the falling away in supplies of Butter has been most pronounced, and prices there sharply advanced several pence per pound. In South Australia print Butters steadily lessened until quantities have now about reached the minimum, and, as a result, prices attracted parcels from New South Wales and Victoria. In lower grade lines, especially Pastry, supplies were so short that at times there was only a narrow range in value between these and tops. Eggs.—Under the influence of a healthy export demand, coupled with the natural shrinkage, rates hardened until 1/- per doz. loose was touched, but had to ease a penny on account of refrigerated sorts offering. Cheese.—Now that South Australian makes have again controlled the trade: a very fair volume of business is recorded. Bacon.—It was

quite recognised that the exceptionally low rates obtaining for the live hog must necessarily cause a reaction, and, owing to the fewer numbers now being offered, curers are already finding a decided improvement in the demand, and Factory Sides show a rise, the market closing firm. Hams have also participated in the better sale. Honey, etc.—The yield has been disappointingly light, to that at first predicted, so that apiarists are now wisely not pushing deliveries. Almonds were not in much request. On the other hand, there were no parcels of the new crop offering.

LIVE POULTRY.—The market is not in any too satisfactory a state; this the result of forwardings being mostly of inferior and poor sorts, which buyers are disinclined to purchase, excepting at a price which leaves little to consignors.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, 3/4 to 3/4½ per bushel 60 lb.

FLOUR.—City brands, £8 to £8/5/-; country, £7/5/- to £7/10/-.

BRAN, 1/-; **POLLARD,** 1/0½ per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/11 to 2/1, prime; White Champions, 2/6 to 2/7, prime.

BARLEY.—Cape, 2/- to 2/3 per bushel.

CHAFF.—£2/17/6 to £3 per ton of 2,240 lb., f.o.b. Port Adelaide, for prime green, new.

POTATOES.—Gambiers, £6/5/- to £6/10/- per ton of 2,240 lb.

ONIONS.—New locals, £10 to £11 for prime per ton of 2,240 lb.

BUTTER.—Factory and creamery, fresh, in prints, 1/2 to 1/5; choice separators and best dairies, 1/- to 1/2; well-graded store and fair dairies, 9½d. to 10½d.

CHEESE.—Prime new make, 5½d. to 6½d. per lb.

BACON.—Factory-cured sides, 6d. to 6½d.; farm flitches and rolls, 4½d. to 5½d.

HAMS.—S.A. factory, 8d. per lb.

EGGS.—Loose, 11d. per doz.

LARD.—In bladders, 5d.; bulk, 4d. per lb.

HONEY.—2d. for prime, clear extracted (new season's). Beeswax, 1/1 per lb.

ALMONDS.—Soft shells, Brandis, 3½d.; kernels, 8d. per lb.

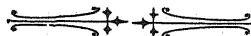
LIVE POULTRY.—Heavy-weight table roosters, worth 1/6 to 2/- each; good-conditioned hens and fair cockerels, 1/- to 1/4; mixed sorts, 10d. to 11d.; poor and weedy, 7d. to 9d.; ducks, 1/- to 2/-; geese, 2/- to 2/9; pigeons, 6d.; turkeys, 4d. to 6½d. per lb., live weight, for fattening to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of March, 1905:—

Adelaide ...	0.16	Hoyleton ...	0.23	Macclesfield ...	0.26
Hawker ...	—	Balaklava ...	0.24	Meadows ...	0.35
Craddock ...	—	Port Wakefield ...	0.17	Strathalbyn ...	0.16
Wilson ...	—	Saddleworth ...	0.10	Callington ...	0.05
Gordon ...	—	Marrabel ...	0.11	Langhorne's Bridge ...	0.22
Quorn ...	—	Riverton ...	0.13	Milang ...	0.43
Port Augusta ...	0.08	Tarlee ...	0.10	Walleroo ...	0.23
Port Germein ...	0.20	Stockport ...	0.10	Kadina ...	0.32
Port Pirie ...	0.34	Hamley Bridge ...	0.10	Moonta ...	0.20
Crystal Brook ...	0.25	Kapunda ...	0.20	Green's Plains ...	0.24
Port Broughton ...	0.31	Freeling ...	0.16	Maitland ...	0.38
Bute ...	0.10	Stockwell ...	0.17	Ardrossan ...	0.17
Hammond ...	—	Nuriootpa ...	0.16	Port Victoria ...	0.45
Bruce ...	—	Angaston ...	0.15	Curramulka ...	0.40
Wilmington ...	0.08	Tanunda ...	0.18	Minlaton ...	0.32
Melrose ...	0.17	Lyndoch ...	0.18	Stansbury ...	0.37
Booleroo Centre ...	0.05	Mallala ...	0.27	Warooka ...	0.57
Wirrabara ...	0.08	Roseworthy ...	0.10	Yorketown ...	0.51
Appila ...	0.21	Gawler ...	0.25	Edithburg ...	0.40
Laura ...	0.19	Smithfield ...	0.15	Fowler's Bay ...	0.25
Caltowie ...	0.19	Two Wells ...	0.10	Streaky Bay ...	0.27
Jamestown ...	0.03	Virginia ...	0.41	Port Elliston ...	0.49
Gladstone ...	0.22	Salisbury ...	0.32	Port Lincoln ...	0.54
Georgetown ...	0.08	Tea Tree Gully ...	0.20	Cowell ...	0.48
Narridy ...	0.08	Magill ...	0.32	Queenscliffe ...	1.14
Redhill ...	0.12	Mitcham ...	0.18	Port Elliot ...	1.53
Koolunga ...	0.10	Crafers ...	0.52	Goolwa ...	0.96
Carrieton ...	—	Clarendon ...	0.56	Meningie ...	0.25
Eurelia ...	0.06	Morphett Vale ...	0.17	Kingston ...	0.24
Johnsburg ...	—	Noarlunga ...	0.14	Robe ...	0.24
Orroroo ...	0.01	Willunga ...	0.26	Beachport ...	0.57
Black Rock ...	0.03	Aldinga ...	0.25	Coonalpyn ...	0.58
Petersburg ...	0.03	Normanville ...	0.49	Bordertown ...	0.58
Yongala ...	0.05	Yankalilla ...	0.19	Wolseley ...	0.61
Terowie ...	0.06	Eudunda ...	0.10	Frances ...	0.05
Yarcowie ...	0.05	Truro ...	0.11	Naracoorte ...	0.13
Hallett ...	0.03	Palmer ...	0.03	Lucindale ...	0.12
Mt. Bryan ...	—	Mount Pleasant ...	0.08	Penola ...	0.26
Burra ...	0.04	Blumberg ...	0.10	Millicent ...	0.40
Snowtown ...	0.25	Gumeracha ...	0.21	Mount Gambier ...	0.41
Brinkworth ...	0.07	Lobethal ...	0.13	Wellington ...	0.17
Blyth ...	0.17	Woodside ...	0.10	Murray Bridge ...	0.26
Clare ...	0.15	Hahndorf ...	0.30	Mannum ...	0.08
Mintaro Central ...	0.16	Nairne ...	0.16	Morgan ...	—
Watervale ...	0.31	Mount Barker ...	0.26	Overland Corner ...	—
Auburn ...	0.21	Echunga ...	0.34	Renmark ...	—
Manoora ...	0.12				



AGRICULTURAL BUREAU CONFERENCE.**NORTHERN CONFERENCE AT PORT PIRIE.**

The Annual Conference of the Northern Branches of the Agricultural Bureau was held at Port Pirie on February 23, the following representatives being present:—Crystal Brook Branch—Messrs. R. and P. Pavy, Venning, Hutchison, and Miell. Koolunga—Messrs. Jose and Sandow. Caltowie—Messrs. Hewitt, Kerr, Royal, Lehmann, Jettner, and H. and J. McCallum. Gladstone—Messrs. Goode, Wornum, and Gallasch. Port Germein—Messrs. Kingcome, Blesing, and McHugh. Narridy—Mr. Dixon. Wandearah—Messrs. Eagle, Munday, Fuller, and Birks. Port Broughton—Mr. Dalby. Port Pirie—Messrs. Smith, Wright, Johns, Humphries, Jose, Teague, Bell, Spain and Wilson. Messrs. J. Miller and A. M. Dawkins (members of the Council of Agriculture), Professor Angus, Veterinary Surgeon Desmond, Mr. P. H. Suter (Dairy Instructor), and a number of visitors were also present.

CHAIRMAN'S ADDRESS.

Mr. W. Smith (Chairman of the Port Pirie Branch) presided, and gave a short address. He extended a hearty welcome to those present, especially to the new Professor of Agriculture and to the other representatives of the Department of Agriculture. He intended to refer only to one matter, viz., were the Branches of the Agricultural Bureau doing their duty and justifying their existence? He thought they were rather inclined to rest on their oars and to become somewhat lethargic in their aims and ambitions. They needed livening up to greater effort. In what direction shall it be? By more largely experimenting, aiming at an increase of production from the land, or by combination to do better in the disposal of their produce as well as in the purchase of necessities. Some Branches were doing this, and it is a movement capable of extension. They wanted to farm their land more thoroughly, to bring it more under intense cultivation, so as to support a larger population; either to be able to keep their sons and their families on the home farms or to employ more labour. Too much of the brain and sinew of the country was leaving for other parts, and it should be their duty to seek the best means to keep and utilise it in the State.

MIXED FARMING.

Mr. C. Goode (of Gladstone Branch) read a paper on this subject, to the following effect:—Great improvements have taken place during recent years in the methods employed by South Australian farmers in the cultivation and production of wheat. The general practice of fallowing; the advent of superphosphates and the drill; greater care in the selection of seed and of the varieties of wheat sown, have made wheat-growing much more profitable than it was a few years ago. It is hardly possible to give too much attention to the cultivation of this cereal, which must continue to be the staple product of the greater proportion of their agri-

cultural lands for many years to come; but it is just possible that the great importance of the wheat-growing industry has been allowed to divert attention from other branches of industry which could be worked very profitably in conjunction with it. In the North they could not expect nor attempt to grow the variety of crops which some of the southern lands were capable of producing, but much more could be produced in the Northern areas than many expect. Oats were now grown on a great many Northern farms where a few years ago they were thought impossible. Their value as horsefeed was, however, yet to be appreciated by many farmers; and while they may not pay to produce in large quantities, sufficient could be grown on every farm to at least give the horses a change of diet. In the season 1902-3 (the driest on record in the district) Algerian oats yielded 25 bushels per acre on fallow on their farm, and the same land cropped the next season with wheat returned 20 bushels per acre. In 1903-4, from 40 acres of stubble land, they cut over 100 tons of hay; and again this season, from land which the previous year gave 26 bushels of wheat, they cut one ton per acre of oaten hay. He thought, therefore, it would pay to crop a portion of the stubble land each year with oats for use on the farm. On fallow oats tend to become too rank, and consequently the hay is not appreciated by stock so well. In any case, he thought it preferable to chaff oaten hay instead of feeding it long. Barley is another cereal to which sufficient attention has not been paid in the North. With them it has also given excellent returns from stubble land; 10 acres last year yielded over 40 bushels per acre, and this year 30 acres gave 15 bushels per acre, although the land was only scarified up once and sown after all other seeding had been completed. Barley is splendid feed for pigs, and its heavy yielding capabilities and the food value of the straw make it a very profitable crop for consumption on the farm. Peas could, he thought, be grown on suitable spots on many farms. Last season they put in about 8 acres with peas, which made rapid and luxuriant growth, but the dry October and the depredations of caterpillars completely spoilt what promised to be a very good crop. This season they were more fortunate, and from about the same acreage gathered a nice stack of haulms and pods. The peas filled out well, but have not been thrashed out. As a bacon-producing food peas hold a very high place; but for almost all live stock they provide a valuable change of diet. They had planted them each year on stubble land, and the rapid and luxuriant growth made on both occasions led him to think that they can be grown successfully under ordinary conditions on most of their farms. The growing of green feed for feeding off by stock is another point in which they were behindhand. Barley, rape, kale, sorghums, and lucerne are all worthy of extensive trial. Such green stuff as cannot be consumed in its natural state could, in the form of ensilage, be stored up for use later on. Where dairying is carried on ensilage will prove most valuable, and he would suggest that a portion of the stubble land should be sown each year to a mixture

of cereals and peas, and converted into ensilage to feed the cows when other succulent feed is scarce. Pig-raising has received rather a shock owing to the outbreak of swine fever in the State, but for those who still believe that "the best way to market your grain is on the hoof," he would recommend the use of barley and peas, in conjunction with wheat, if not in substitution for it altogether. He would leave it to the poultry enthusiast to elaborate on the value of the fowl on the farm, and, undoubtedly, as farmers, many of them yet have to learn their value. A good variety of food, such as the crops he had named, would go a long way towards contributing to successful poultry raising and egg production. The practice of keeping sheep on the farm is now so general that there can be little difference of opinion as to their value as an aid to farming. Indirectly, they assist in keeping the fallow clean, but he did not advocate keeping sheep to do the work of the cultivator. Let the sheep eat as many of the weeds which grow on the fallow as they will without any punishment, but don't starve them into eating that for which they have no relish. The direct returns from sheep are quite sufficient to justify their place on the farm. A fair return in wool alone is always assured, but it is in the production of lambs for freezing purposes that sheep will give the greatest profit. For this purpose undoubtedly the crossbred lamb from the Merino ewe stands pre-eminent. The Dorset-Horn has many advocates, and for early maturity this cross was difficult to beat; but, in his opinion, the Shropshire-Merino cross produced the ideal lamb for the freezers. Short on the leg, square-bodied, and splendid doers, carrying a profitable fleece, they combine merits found in few, if any, other crossbred lambs. Two hundred and ten lambs of this description netted them an average of 15s. per head this season, while the ewes which reared them returned 5s. per head for wool. He attributed the splendid condition in which these lambs were marketed to the fact that they had used superphosphates fairly heavily on their land during the past five years. The quantity of the feed had increased, and the quality also, and he would advise liberal applications of superphosphates with the various crops sown. Do not be afraid to get up into the hundredweights. It is a sound investment, and if they did not get the full benefit directly in the wheat it would more than come back after the lambs were marketed.

An interesting discussion ensued, members giving their experiences in the use of manures. Several stated that on their land anything over 60 lb. to 90 lb. of super per acre was unprofitable. On the other hand, one member said since he had put on heavier dressings his yields had been doubled. The Hon. Alfred Catt raised the question as to whether the continuous use of phosphates by themselves would not exhaust the soil of other constituents. Professor Angus, in reply, stated that it was only a matter of time when it would be necessary to apply some other constituent, most probably nitrogen first, as South Australian soils appeared rich in potash. They must not forget, however, that manuring was only one

factor in production. Cultivation was a most important factor. Australian farmers laid themselves open to the charge of not cultivating their land thoroughly; at any rate, cultural operations were not so thorough or systematic as in the old country. Of course, it was only by actual experiment that they could find out what procedure was best, and no doubt much of the diversity of experiences mentioned in the discussion was due to variation in soil, etc. He intended to make experimental work a prominent feature in the operations of the Department of Agriculture, and relied upon the members of the Bureau for their co-operation and support.

DAIRYING ON THE FARM.

The Hon. Secretary read a paper on this subject, written by Mr. J. Darley, of Narridy Branch, of which the following is the substance:—

Any one intending to go in solely for dairying should select a farm as near the railway and market or butter factory as possible, to save cartage, and that they may be enabled to deliver their cream or milk in the best of condition, which is a most important item in connection with dairying. But on all farms a few cows can be turned to a source of profit, and especially where the farmer has a family. A cross of the Shorthorn with any other breed than the Holstein or Hereford would be the most suitable class of cattle to keep on the farm for general purposes, for, in addition to milk and butter qualities, it was advisable to raise a class of cattle that would realise a fair price in the market for beef. The dairy should be built of stone, with iron roof, and a second roof of straw or reeds above, about three feet in the ground. Good ventilation is essential. It is out of the question to keep any dairy quite cool when the thermometer registers over 100° in the shade, but a dairy built as above will cool very quickly with a cool change. For a herd of nine or ten cows it is necessary to purchase a 30 gallon capacity separator, but the separating should not be done in the dairy, as it is almost impossible to avoid spilling milk when separating, and it would have a detrimental effect on the quality of the butter produced. He believed that taints in butter, which were often attributed to weeds, would mostly be found to originate from conditions existing after the milk has left the cow. Consequently nothing but milk, cream, and butter should be kept in the dairy. The dairy should be whitewashed frequently. The secret in successful dairying is cleanliness. The present method of marketing their produce was not satisfactory. They were entirely in the hands of private firms, and there was a strong feeling amongst many farmers that they did not always get a fair deal. He would, therefore, advocate the establishment of a farmers' co-operative butter factory in Adelaide, in which suppliers only should be shareholders, and that the profits should be divided according to the amount of produce contributed by each shareholder. He was not in sympathy with the action of the Government in appointing a man as Dairy Instructor to tour the country, edu-

cating the farmers on dairying matters. In his opinion this was simply waste of money, as most farmers' wives knew as much or more about dairying than the instructor, and with those who do not pay attention to cleanliness in the dairy all the instruction that can be given will make no difference. They could, however, profitably utilise the services of these instructors in examining all butter for export, and stopping the shipment of any but first-class butter. Those dairymen who were careless could have no better instruction than to find their inferior product unsaleable, or only to be sold at a sacrifice. That much inferior butter was exported was shown by the prices obtained in London, South Australian butter realising 6s. per cwt. less than Victorian. He was satisfied that the dairying industry was worthy of more attention than had been given to it in the past, especially in respect to the quality of the product.

Professor Angus briefly criticised the paper. In South Australia many farmers were handicapped in that their conditions were not entirely suited to dairying pursuits. He was strongly in favour of the Shorthorn milking strain of cattle, but they must not overlook the fact that there were also beef strains of Shorthorns. There was nothing to beat the Shorthorn for crossing, to secure a dual-purpose cow, but the dairyman should not go beyond the second cross. If they got a good milking strain of cows, he advised them to stick to it, whatever breed it was. More attention must be paid to the quality of their butter. He had been greatly surprised at the inferior quality of some of the butter that was being exported to London. High quality and uniformity were essential if they were to realise satisfactory prices in London.

CULTIVATION AND IMPLEMENTS.

Mr. W. J. Venning read a paper on this subject. The results of their daily practice in the cultivation of the soil were exciting the mind of the farmer to enquiries as to what were the best methods of cultivation. Generally it could be said that on the Northern plains fallowing had been proved to be essential. They found great variations in the soils of any one district and on individual farms, and these variations must be studied by the farmer. With most of their lands deep cultivation was a mistake; it brought the raw soil to the surface. In some cases it might be an advantage to stir the soil deeper than usual, but the subsoil must not be brought to the surface. The objects of cultivation were to turn under and destroy weeds, to clean the land, and to improve its condition, but he failed to note any instance of benefit derived in these districts from the ploughing under of stubble. Deep cultivation on their low lands seemed to bring the salt to the surface, and on the higher and lighter lands caused drift. They could always gain useful knowledge by studying the work of the diligent, successful man. He had done this for a long while, and nowhere on their low country had he found good crops grown on deeply-worked land. The best results were obtained where the

land was ploughed lightly and thoroughly worked to clean it, and to secure a fine mould for the seedbed. They needed to get their crops to start away well and to make good growth during the winter, but this would not be attained if the seed was sown in badly worked land, with rough or partly broken clods. With heavy land, whether they ploughed deeply or shallow, they could not use the harrows too freely. The utility of fallowing having been proved, the question as to when the land should be broken up is one of great importance. It had frequently been shown that certain land gave the best results when ploughed up in February or March, and worked throughout the winter. This early ploughing let the sun and air penetrate the soil, and appeared to have a marked influence on the fertility of the soil. The growth of weeds on the fallow must be prevented, as they take up the moisture required for the crop. In ploughing, they would find that if they turned under a lot of dry rubbish the soil remained too open and loose, and for this reason he considered it preferable in the dry areas to either leave the stubble land out for a year or two, or to burn it before ploughing. Cultivation of a growing crop has two objects: the stirring of the surface soil and the destruction of weeds which rob the crop. Professor Custance years ago told him that it was beneficial to harrow after rain, but his experience was that under such circumstances they did not harm the weeds much. While the general experience was that harrowing the crop was beneficial, he could not say at what stage of growth the operation should be performed. In regard to implements, there had been many improvements of late years in their ploughs, but he was afraid that they could not claim that these improvements had tended to better cultivation. They had seen that one of the objects of cultivation was to loosen the soil, but if they examined the bottom of the furrow left by one of the latest ploughs with a long sole plate, they would find a smooth, hard face. When the roots of the wheat plant get down to this they would spread out, instead of penetrating into the moist subsoil. Then, again, all their modern ploughs have wide shares for destroying weeds. These leave a smooth bottom, and, in his opinion, this was a great mistake.

Considerable discussion followed the paper, especially on the subject of deep ploughing. Several members agreed that on the western side of Flinders Range deep ploughing was usually a mistake, while others from the eastern districts, where the land was heavier, had found deeper cultivation beneficial. Mr. Gallasch agreed with Mr. Venning that the wide share left a smooth bottom, but this could be avoided by using disc implements. He had harrowed his crops when about six inches in height, and thought they had benefited from it. Mr. Johns thought they could not lay down any hard-and-fast rules, as each farmer must be guided by his own surroundings and conditions. He found, for instance, that he dare not treat his sandy land in the way generally recommended, as there was too much risk of its drifting. Mr. Wornum thought that often varying results were due more to the condition of the seedbed than to the

depth to which the land was ploughed. They must secure a good seed-bed, whatever the nature of the previous cultivation. Mr. Dawkins held that cultivation was quite as important as manuring. They should keep the land in fine tilth throughout the summer to conserve the moisture, and to encourage nitrification. A fine surface and firm seedbed were important factors in the production of a good crop. In connection with deep cultivation they must remember that if they turned the sour subsoil to the surface, it would be two or three years before it would be in fit condition to grow crops. Professor Angus agreed with those who said that no hard-and-fast rule could be laid down in regard to methods of cultivation. Each must study his particular conditions. Deep ploughing and deep cultivation were not the same. While it might not pay to plough deeply, deep stirring of the under soil without bringing it to the surface was beneficial. Probably the use of disc cultivators would overcome the difficulty referred to in connection with the use of wide shares. He was satisfied that cultivation played a more important part in the success of the crop than it was given credit for. With a good rainfall and thorough cultivation there was not much necessity for the use of artificial manures. He was of opinion that in burning off the stubble the farmers made a great mistake, as they destroyed what would cost a lot of money to replace, viz., nitrogen. Why should not the farmer collect the stubble, mix it with soil, and let it decompose before putting it back on the land?

COMMON AILMENTS OF THE HORSE.

Veterinary Surgeon Desmond gave a very interesting and instructive address on this subject, illustrating his remarks by the aid of blackboard sketches. The following is a short abstract of some of the principal points dealt with:—The horse had one peculiarity that should be noted: he could not breathe through his mouth. It was a common but dangerous practice to give a horse medicine through its nose, sometimes resulting in serious trouble owing to the fluid reaching the lungs. In drenching a horse the proper method was to put a halter under his top jaw, raise the head, pouch the lips, and pour the medicine in at the back of the teeth, where he could not get rid of it except by swallowing. If it is placed on the tongue a clever horse will block it every time. Dealing with lampas, he said this was not a disease, but a trouble due to the horse erupting his teeth, causing the membrane of the palate to swell. The practice of burning the lampas was brutal and unnecessary. When it was done, the usual result was that the teeth were affected by decay below the gums, and the animal suffered from foul breath for the rest of his life. A horse with lampas should be fed on soft food, and in obstinate cases lance the swelling close to the gums. To prevent the knife going in too far, put a piece of cork on the blade. Care must be taken to avoid cutting a nerve or artery. Dealing with the eye, Mr. Desmond called attention to the injury caused by the glare where the stables

were whitewashed, and advised putting a little lampblack in the wash to colour it. Ophthalmia was quite common in the North, and the treatment recommended was bathing with a weak solution of washing soda. Much eye trouble was caused by improperly shaped blinkers. The blinker should sit close behind the eye, and open out wide in front, to let the horse see on both sides as well as in front. Strangles was another common complaint, and was closely allied to influenza. He had treated of both these complaints in a recent issue of *The Journal of Agriculture*. With sore shoulders cleanliness was essential, and simple applications were best. A very strong solution of washing soda was unequalled. To avoid sore shoulders, see that each horse had its own collar, and that it is kept clean. Before using a new collar soak it well in water, so that it will shape itself to the horse's neck. Dealing with the shoeing of horses, he stated that the average blacksmith was too free with the knife, and often ruined the horse's feet. It was rare to see a horse with a natural hoof now, and this was due to irrational practices in shoeing. The rasp should never touch the outside of the hoof, and neither the frog nor the bars should be cut. Where possible to do so, it was better to keep the horse unshod. Before a horse was re-shod it was a good practice to take off the shoes and work him for a few days without them. Sidebone was caused by concussion due to the removal of the frog. On the subject of feeding and watering, the speaker remarked that as the capacity of a horse's stomach was about four gallons, it was not a rational practice to allow him to drink directly after a good feed; yet how many farmers did this? The proper method was to let him have a drink first. No injury would result from allowing a horse to drink when he is hot, provided the water is not very cold. Such large carrying firms as John Hill & Co., Limited, the tramway companies, and others allowed their horses to drink whenever they could get it. Dealing with intestinal trouble, the horse-owner was advised not to be in a hurry to give medicine. They might give the animal something to deaden the pain and allow nature a chance to remove the cause. The different forms of colic and their treatment were described. He did not favour the use of opium as a narcotic for horses; chlorodyne was much superior. For a hack the dose would be a tablespoonful of the imported article, or one and a half tablespoonfuls of the local. For a draught horse the dose should be increased.

Considerable discussion followed, a number of questions being asked by members of the audience.

AGRICULTURAL EXPERIMENTS.

Professor W. Angus gave a short address on the purpose and value of agricultural experiments. He also indicated the lines upon which the Department intended to take up this work, and appealed to members of the Bureau for assistance in carrying out the experiments.

DAIRYING.

Mr. P. H. Suter (Dairy Instructor) gave an interesting address on the general aspects of dairying, illustrating his remarks with numerous lantern illustrations.

SOCIAL.

The proceedings closed with a social to the visitors, a very enjoyable evening being spent.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.		Date of Meeting.		BRANCH.		Date of Meeting.	
Ardrossan	..	Apr. 19	May 17	Morchard	..	Apr. 15	May 13
Arthurton	..	13	—	Morgan	..	15	13
Bagster	..	15	20	Morphett Vale	..	18	—
Balaklava	..	8	13	Mount Gambier	..	8	—
Booleroo Centre	..	18	16	Mount Remarkable	..	13	18
Bowhill	..	1	6	Nantawarra	..	19	17
Brinkworth	..	7	5	Naracoorte	..	8	13
Burra	..	15	19	Narridy	..	22	—
Cherry Gardens	..	18	16	Norton's Summit	..	14	19
Clare	..	14	19	Onetree Hill	..	13	18
Colton	..	1	6	Orroroo	..	14	12
Endunda	..	17	15	Penola	..	8	13
Finniss	..	3	1	Penong	..	15	—
Forest Range	..	13	18	Petina	..	22	20
Gawler River	..	14	19	Pine Forest	..	18	16
Gladstone	..	1	6	Port Broughton	..	15	13
Golden Grove	..	20	18	Port Elliot	..	15	20
Gumeracha	..	17	15	Port Lincoln	..	22	19
Hartley	..	—	19	Port Pirie	..	15	13
Inkerman	..	18	16	Redhill	..	18	16
Johnsburg	..	15	—	Richman's Creek	..	17	22
Kanmantoo	..	14	19	Riverton	..	15	20
Kingscote	..	10	8	Saddleworth	..	21	—
Kingston	..	29	27	Stansbury	..	1	—
Koolunga	..	13	18	Strathalbyn	..	17	15
Koppio	..	20	18	Utera Plains	..	15	20
Longwood	..	22	20	Virginia	..	17	15
Lyndoch	..	13	18	Wandearah	..	17	15
Maitland	..	1	6	Whyte-Yarcowie	..	15	20
Mallala	..	3	1	Willunga	..	1	6
Mannum	..	14	19	Wilmington	..	12	17
Meningie	..	8	13	Wilson	..	15	—
Millicent	..	13	4	Woolundunga	..	8	13
Minlaton	..	8	6				

AGRICULTURAL BUREAU REPORTS.

Tatiara, February 18.

PRESENT—Messrs. Fisher (chair), Wiese, Stanton, Reschke, Truman, Killmier, and Bond (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed twelve meetings held, with an average attendance of only six members.

MANURING.—Members wished to know best kind of manure to use on poor, sandy soil over clay. [Impossible to say without further details.—Ed.]

Davenport, February 16.

PRESENT—Messrs. Hewitson (chair), Hodshon, Roberts, Pryor, Bothwell, Kingham, and Lecky (Hon. Sec.).

QUESTION BOX.—A number of questions were asked through the Bureau question box, and these had been submitted prior to the meeting to different members for reply. The principal items are published below.

RABBIT DESTRUCTION.—Where the poison cart is not used, Mr. Kingham suggested that the local governing bodies and station owners should encourage the destruction of rabbits by buying properly stretched skins from trappers and others, paying a halfpenny per lb. under Adelaide prices, to cover cost of sending to market. If the skins were painted with weevil wash and properly tied up in bundles they could be kept for a long while without injury.

FALLOWING.—Mr. Hodshon considered fallowing advisable only on stiff land in this district, and preferred summer fallow to winter fallow.

POTATOES.—Mr. Hodshon recommended planting potatoes for first crop in January or February in this locality, covering the seed to a depth of 4 in.

BREED OF SHEEP.—Mr. Pryor considered the Merino the best for their northern country, but in other parts the climatic conditions and the markets available make other breeds worthy of consideration. In some parts the Merino is not suitable, the Lincoln taking its place, while in those districts where breeding of lambs for export can be undertaken, the Merino ewe, crossed with Shropshire, Dorset-Horn, or Lincoln ram, is the favourite.

WATERING HORSES.—Members differed somewhat on this point. Mr. Bothwell would allow a thirsty horse that was not heated to drink water before feeding but not otherwise. Two members quoted an article in which free access to feed and water was recommended, and they agreed with this advice.

MIXED FARMING.—In reply to question as to what branch of rural industry could be most profitably worked in the North in conjunction with wheat-growing, Mr. McDonald strongly recommended the keeping of sheep. With careful selection and management sheep would pay well on their northern farms.

DOES POULTRY-BREEDING PAY?—Mr. Lecky, in reply to this question, contended that poultry-breeding in this district did not pay, owing to cost of food; though poultry kept for private use repaid the householder. Mr. Kingham submitted a statement showing results of 41 weeks' experience with his fowls, as under:—

Dr.			Cr.		
1904: May 1—	£	s. d.	1905: Feb. 15—	£	s. d.
To value 38 fowls ...	2	17 0	Total value eggs laid ...	8	13 3
" " 6 young fowls ...	0	4 6	" " fowls eaten and		
" " 16 chicks ...	0	4 0	sold ...	2	5 6
1905: Feb. 15—			" " stock, 24 fowls, at		
To value 41 weeks' food ...	4	2 3	1s. 6d. ...	1	16 0
" " eggs for sitting ...	0	7 0	" " 33 young pullets,		
" " profit balance ...	7	14 0	at 1s. ...	1	13 0
			" " 21 young cockerels,		
			at 1s. ...	1	1 0
Total ...	£15	8 9	Total ...	£15	8 9

DAIRYING IN THE NORTH.—Mr. Roberts did not consider farmers in the North had given sufficient attention to the question of the establishment of butter factories. Dairying could be profitably carried on in the Far North to a greater extent than at present. Mr. Pryor considered that the lack of facilities for carrying milk and cream was a grave drawback, not only to the establishment of butter factories, but also to the development of dairying generally.

STOPPING DRIFT SAND.—Mr. Holdsworth replied to question as to best means of stopping sand-drifts. Marram grass was unequalled for coast drifts, but had proved a failure on the red sands round Port Augusta. Couch grass had been most successful. Johnson grass, ice plant, portulacca, and other plants had also proved useful. He considered it almost essential that a covering of some sort should be placed on the sand to hold it while the grass or bushes were getting a hold. For this purpose farmyard manure spread to a depth of 3 inches was most useful, a fair amount of herbage being produced while the native herbage flourished. Seaweed, city refuse, and street sweepings were also effective agents.

LUCERNE FOR STOCK.—Mr. Pryor had found from experience that the best time to cut lucerne for feeding to horses, both from an economical point of view as regards the lucerne, and also to the advantage of the animal being fed, was just as it was coming into flower. The crop was then at its heaviest and best, being firm and solid without being hard or tough, and with plenty of moisture without being watery. To give to cows to get the best return in either milk or butter it should be cut in the flower stage.

Penong, February 18.

PRESENT MESSRS. Oats (chair), Weber, Murray, Sleep, F. G. and E. J. Richardson, Saunders, Shipard, and Wiseman (Hon. Sec.), and three visitors.

SEEDING AND CULTIVATION.—The Chairman read a paper on this subject. When the West Coast was first settled, the farmer sowed his seed in the most convenient paddock, as the land was all new and free from weeds; but now that he is dealing with land that has carried several crops, and has to contend with weeds and rabbits, he must use his head before he uses his implements. It is not always that he can put in crop the most suitable block of land, as, on account of the necessity for protecting the crop from rabbits, it is necessary to keep the cultivated land in a compact block. Unless a man has new land to crop, he should fallow some land each winter. On the box country the more he could fallow the better; but on the scrub land fallowing had not always proved a success, though his experience had been that, apart from the yield of grain, the straw was heavier on the fallowed land. The box land should be well worked during the spring; but owing to the liability of the scrub land to drift he thought they would gain nothing by spring cultivation, but it should be worked again in some way before starting seeding operations. He considered the plough the best implement for this purpose, working as shallow as possible so long as all the land is turned. The drill should be kept close up to the plough; although somewhat slow, the drill was preferable to the plough with seedbox attachment, as it sowed the seed to a regular depth. As their land was not clear of sticks, stones, etc., he thought the disc-drill more suitable than the hoe-drill. Seeding should be started about the beginning of April, and finished about May 20. It was very important that good seed should be sown. As there were a number of good rust-resisting or rust-escaping wheats, some of these should be selected. The experiences of the past two years had shown them the necessity for this. Smutty seed should not be used, unless quite necessary, in which case it should be carefully pickled. They had but little experience in the use of fertilisers in this district. He put on 100 lb. per acre of super four years ago; but the crop was poorer than on the unmanured land. Last year he drilled in 50 lb. of super per acre, and was satisfied that with an average rainfall the manure would pay well for itself. A lengthy discussion on fallowing ensued. Members generally agreed that fallowing would pay well on the plain and bush land, and that the plough was the best implement for destroying weeds.

Richman's Creek, February 20.

PRESENT—Messrs. Knauerhase (chair), Wright, J. M. and J. K. Kelly, Nicholson, Roberts, Hilder, McSkimming, Gebert, J. H. and F. H. Lehmann (Hon. Sec.), and four visitors.

DEEP v. SHALLOW PLOUGHING.—The Chairman initiated a discussion on this subject. The grey soil of the district, if worked deeply, became too loose, and would not set down firm, the result being that the seed was buried too deeply, and the crop was a failure. Mr. Wright said he would only plough 3 inches deep, as he did not consider, with their porous soils, deeper stirring was necessary. Most of the members agreed that deep ploughing was not desirable in this district; but Messrs. H. V. Wright and J. McSkimming found that on their farms ploughing 5 inches deep gave best results.

RAISING WATER.—Discussion took place on best and cheapest means of raising water from wells. Windmills had not proved an unqualified success, and on several farms had been replaced by horseworks or windlass. The majority of the members thought that only powerful and well-made windmills and pumps would be satisfactory in wells 100 feet or more in depth. Mr. A. Nicholson considered windpower the cheapest and most effective power for raising water; he had had one mill in use for twelve years over a well 100 feet in depth, and it was only recently that he had had to pay for trifling repairs.

WHEAT EXHIBITS.—Several specimens of wheat were exhibited. Marshall's No. 3 was placed first, and Steinwedel second.

DESTRUCTION OF RABBITS.—Members were of opinion that the most effective way to deal with the rabbit was to distribute phosphorised pollard first, afterwards digging out the burrows.

SOWING WHEAT.—In reply to question, members generally advocated sowing wheat 2 inches deep with the drill. If possible, they would sow after rain, when there was sufficient moisture to cause early germination. They did not consider it was wise to sow before the middle of March.

SEPARATOR MILK FOR CALVES.—Most members considered froesh separator milk good feed for calves, and would not add anything to it to replace the butter fat that had been abstracted. Mr. J. M. Kelly stated that he made it a practice to add a little salt to the milk before feeding it to his calves.

Lucindale, February 18

PRESENT—Messrs. Feuerherdt (chair), Tavender, McInnes, Carmichael, Dow, Williams, Lanberg, Matheson, and Beaton (Hon. Sec.).

PURIFYING WATER WITH BLUESTONE.—The Chairman stated that having noticed the report of the successful use of bluestone in reservoirs and dams for destroying weeds and algae, he had tried it in a well and tank where a green scum always formed on the water. The result had been very satisfactory, the water being quite free from scum three weeks after treatment. [Great care must be exercised in the use of bluestone for this purpose, as, if an excess is used, the result may be disastrous.—Ed.]

Mount Bryan East, February 18

PRESENT—Messrs. T. Wilks (chair), E. Wilks, Bryce, Teddy, B. H. and R. W. Dunstan (Hon. Sec.), and one visitor.

THE AGRICULTURAL BUREAU.—The Hon. Secretary read a paper on the objects, privileges, and duties of members of the Bureau. The object of the Bureau was the improvement of the agricultural industry by the dissemination of practical information and scientific knowledge. The Bureau was largely utilised by the scientific officers of the Department for educating the farmers in the latest methods in the raising and treatment of produce. In his opinion it was a great privilege to be a member of the Bureau, and there were also certain duties attached to membership. A member should be a regular attendant at the meetings, and take his share of the work. He should feel it his duty to bring under the attention of other members any matter of practical interest connected with agriculture which he may notice, and should give freely of his experience for the benefit of his fellows. If each member would realise his responsibilities in this direction, the monthly meeting of the Bureau would be both interesting and instructive to all concerned.

Angaston, February 25.

PRESENT—Messrs. Rundle (chair), Snell, Plush, Friend, Player, Trimmer, A. and S. O. Smith, Evans, Thorn, Salter, Shannon, and Matthews (Hon. Sec.).

TASMANIAN FRUIT-GROWING.—At previous meeting Mr. Jas. Rundle read a paper on this subject to the following effect:—Most orchards are planted on the north-eastern side of hills, and the soil is not by any means rich, but has a sound clay subsoil, with an excess of moisture, which is carried off by draining. Drains are cut, and rough stones placed in the bottoms, then cuttings, etc., thrown in, and the earth filled in on them. Soil is broken up to a depth of from 10 to 12 inches. Holes are dug a spit deep, about 2 ft. 6 in. across. The soil from the hole is thrown aside to sweeten, some time before planting. Trees are planted from 10 to 15 feet apart. One-year-old trees with single stems are preferred. These are cut back to within 1 foot of the surface, and the following year each shoot to about 8 inches. This gives a good, sound foundation on which to build the future tree. Great care is taken during the first five years to get the trees into shape. Most young trees will make sufficient buds without leaving spurs on them; but this depends on the land they are planted in. If the ground is strong and rich, it is sometimes a trouble to settle the trees into bearing. In such a case it is advisable to give them a shock by summer pruning, which will check their growth and make them form fruit-spurs; but if the land is light they seldom require such treatment. The principal apple-growing district is on the Huon River, where over half a million bushels were produced last season. One comes to the first orchard about 15 miles from Hobart (south), on the Huon Road, and they extend for 30 miles, or nearly to the south coast; and on the west, up the Huon for 10 miles to and past Franklin to Geevestown; and east to Port Cygnet, about the same distance. One is struck by the lowness and spread of the trees, and the enormous crop they carry. All orchards he saw had been well worked; but at the time he was there (middle of November) the ground was too wet to put a horse on it. The rainfall in some of the towns in this district runs up to 40 odd inches. Last year Tasmania produced 970,000 bushels of apples, of which nearly 500,000 bushels were exported to Europe, besides large quantities to Victoria and New South Wales. One gentleman expressed himself strongly on the question of over-production. He thinks, with the enormous areas of land being planted, that in the near future apples will be hardly worth picking. Mr. Rundle did not, however, agree with him, as there is not the slightest doubt that as the price of apples comes within the reach of the poorer classes in England the quantity consumed will be enormously increased. While the retail price at the present in London was almost prohibitive to any with small incomes, still the grower gets but a small picking of this, the whole trouble being that freight and charges are too high. Some very heavy yields are obtained in Tasmanian orchards. One French Crab tree yielded 40 bushels, and half an acre of Cleopatras gave the owner £120 worth of fruit sold in Hobart last year. Good apple land is very expensive. On the Huon virgin soil is selling at £40 to £60 per acre, and the cost of preparing the land is heavy. An orchard in bearing in the Bagdad Valley sold for £240 per acre. Apple cases are very much cheaper. Messrs. Jones & Co., Hobart, quote boxes not made up at 4½d. in a small way, or 4½d. for lots of, say, 6,000. Pear boxes are made to take one layer only; size, 30 x 15 x 3 in. deep, outside measurement; 5-in. palings are used for top and bottom. In making up the cases a thick plank bench is used, with grooves cut in at the required distance, about 1 in. deep, to take ends of boxes. These hold the ends in an upright position while one side is nailed on. The various diseases and pests affecting the trees were referred to, and the measures adopted to combat them were outlined. So far as he could ascertain, the following were the apples most in favour:—Worcester Pearmain, Scarlet Nonpareil, Sturmer Pippin, New York Pippin (Cleopatra), Lane's Prince Albert, Jonathan, Crofton Pearmain, Pomme de Nègre, French Crab, Cox's Orange Pippin, Alfriston, and Adams' Pearmain. Other matters of interest, including a visit to the Government Poultry Farm, the fat lamb industry, the growth of fodders, the studs of sheep, cattle, and horses, were also touched on.

MILDURA.—Mr. F. Salter read a paper on a recent visit to the Mildura Irrigation Colony. He made a careful inspection of various vineyards and gardens, drying-sheds, packing-houses, etc., and was well pleased with his trip. He gave an interesting description of what he saw, and had formed

the opinion that Mildura was admirably suited for the growth of raisin and sultana vines and lemons, while the currant did fairly well. Apricots did well on suitable soil, and were very free from disease; they were, however, exceedingly susceptible to injury by salt. The salt question was undoubtedly one of the greatest difficulties that faced Mildura growers. The "get-up" of the dried products, which Mr. Salter brought back with him, was an object lesson to members.

VISIT TO EVANDALE.—This meeting was held at Messrs. Evans Bros.' fruit-drying establishment. Members were shown over the works, and were greatly impressed by the magnitude and completeness of the plant, and the high quality of the dried products.

Koolunga, March 16.

PRESENT—Messrs. Butcher (chair), Button, Sandow, Shipway, Palmer, Jose, Fuller, Hutchison, Lawry, Butterfield, Burgess, and Noack (Hon. Sec.)

COST OF WHEAT-GROWING.—Considerable discussion on this subject took place. Members were unable to state what it cost them under average conditions to produce a bushel of wheat. They were also unable to understand upon what authority Coghlan based his official pronouncement that a 7-bushel yield in South Australia was financially as profitable as a 15-bushel yield in New South Wales. Several of the members were exceedingly dubious as to the accuracy of the statement. It was generally agreed that it was doubtful whether wheat-growing of itself actually paid.

PORT PIRIE CONFERENCE.—Delegates reported on proceedings of Conference, which they regarded as highly successful.

LUCERNE.—Mr. Lowry tabled sample of lucerne showing 3 feet of growth in five weeks under irrigation.

Onetree Hill, March 16.

PRESENT—Messrs. Hogarth (chair), Blackham, G. and F. Bowman, Cowan, Flower, W. and E. A. Kelly, and Clucas (Hon. Sec.).

SHEEP-POISONING.—Mr. Blackham called attention to report from Victoria of losses of sheep, which, owing to the presence of scraps of rabbit fur, skin, etc., in the stomach, was attributed to the sheep having eaten the bodies of poisoned rabbits.

STANDARD BUSHEL.—Members considered that the present system is an injustice to the producer, who was docked in price for wheat under weight, while no allowance was made for overweight samples. It was pointed out that New South Wales wheat brought as much as South Australian, although the standard in the former State was only 59½ lb. per bushel.

Pine Forest, February 14.

PRESENT—Messrs. Bayne (chair), Johns, Inkster, R. W. and R. Barr (Hon. Sec.).

POULTRY.—Mr. R. W. Barr read a paper on this subject. His experience in introducing a new breed was that it was more profitable to buy a few young birds than to purchase eggs for sitting, as a considerable number of birds could be reared from the former during the season, whereas with sittings of eggs there was in one of his experiences no chicks to show for an expenditure of 30s. For this district he placed the Leghorn first, with the Wyandotte and Orpington second and third. He emphasised the necessity for regular feeding, clean, fresh water, and variety in the food supply. The Chairman's experience was that it was cheaper to buy sittings of eggs in getting new strains. He used to keep the Wyandotte and Orpington breeds pure, but recently had allowed them to cross with each other, his experience being that the first cross was hardier and more profitable on the farm than the pure breeds. Mr. Johns stated that, owing to recurring outbreaks of disease, his experience with poultry had been decidedly unprofitable.

Petersburg, February 25.

PRESENT—Messrs. Cadzow (chair), Sambell, Philp, Nourse, Earle, Bottrill, Travers, and Wilson (Hon. Sec.).

DAIRYING.—Most of the members were agreed that for this district the Jersey-Shorthorn cross was most profitable, as the extra quantity of butter the cow would give would more than compensate for the loss of weight of carcase, when compared with the purebred Shorthorn or other large breed. Mr. Travers recommended giving 5 lb. of bran, mixed with wheat-chaff, as a daily ration; while Mr. Philp had been advised that equal quantities of bran and pollard, mixed with chaff, kept the cow in better condition than did bran and chaff. Mr. Bottrill advised adding a little salt to the daily ration, or else placing rock-salt under cover, where the cows could lick it when they wanted to. A little bonemeal would be found beneficial to the cows. Reference was made to losses from "dry bible," etc.

Arthurton, March 17.

PRESENT—Messrs. Hawke (chair), Koch, Pearson, Rowe, Stephenson, and Palm (Hon. Sec.).

DOES WHEAT-GROWING PAY?—Members were of opinion that, owing to varying circumstances and conditions, it was not possible to say whether wheat-growing alone paid. They also thought it unreasonable to expect the farmers to give publicity to their financial affairs.

STANDARD BUSHEL.—This Branch is of opinion that it is to the benefit of the farmer to have the f.a.q. standard for wheat fixed as high as the season's crop warrants, and also that the standard should be fixed as early as possible in the season.

Kapunda, March 18.

PRESENT—Messrs. O'Sullivan (chair), Banyer, Flavel, Windebank, Weckert, Vogt, Kerin, Morris, Byrne, Teagle, O'Dea, Shannon, Pascoe, Harris, and Holthouse (Hon. Sec.).

MANURING. The Hon. Secretary read a paper on this subject, written by Mr. J. S. McCall. He held that the good results at present obtained from the use of phosphates could not continue for ever, and sooner or later the other constituents necessary to the production of crops would become deficient. They must not overlook the great natural law, that the essential constituent present in the soil in the least proportionate amount governed the crop. Usually all the required constituents, except nitrogen, potash, and phosphoric acid, were present in abundance. While nitrogen and phosphoric acid were usually present in about the same proportions in the soil, the wheat crop removed twice as much nitrogen as phosphoric acid. In addition to this, while the soil can fix and hold phosphoric acid, nitrogen was washed away in winter, and during heavy showers in summer, where the land is in fallow. With potash there was twice as much present in the straw as in the grain. When the straw is burnt the potash is returned to the soil, but the nitrogen is lost. It was therefore better to feed the straw to stock, and plough under the balance. For the good of the land light dressings of nitrogenous manures should be supplied. Leguminous crops should be grown and fed to stock on the land. Where both straw and grain are sold off the farm, potash in the form of kainit, sown with the seed, may prove beneficial.

STANDARD BUSHEL.—Mr. O'Dea read article in *Journal of Agriculture* on the f.a.q. standard, and considerable discussion ensued.

Redhill, February 21.

PRESENT—Messrs. Robertson (chair), Nicholls, Torr, Wheaton, Steele, D. and J. N. Lithgow (Hon. Sec.), and one visitor.

FORMALIN.—Mr. Wheaton stated that last season he used formalin for pickling his seed wheat, treating three bags in all, and was so well satisfied with the result that this year he intended to use nothing but formalin.

Whyte-Yarcowie, March 18.

PRESENT.—Messrs. Hack (chair), Dowd, Pascoe, Mitchell, Hatherly, Kornietzky, Pearce, Faul, Mudge, and Boerke (Hon. Sec.), and three visitors.

SEED WHEAT.—Mr. Dowd considered machine-threshed seed wheat inferior for seed, because it was cut too early, and was more likely to produce a smutty crop. He held that wheat allowed to get thoroughly ripe was less liable to smut, and in support of this idea pointed to the fact that self-sown crops were rarely affected by smut. Some Northern farmers make it a practice to expose their seed wheat to the sun's rays. [Liability to attack by hant or smut is not affected by the immaturity of the seed sown. The fact that self-sown wheat is usually free from smut does not prove Mr. Dowd's contention. Most farmers know that unpickled wheat can be sown in dry land with little risk of injury by smut. This is due to the fact that very much less moisture will cause the smut spores to start than is required to germinate the wheat, and as the fungus has no wheat-plant to live upon, it succumbs. Self-sown wheat practically occupies the same position as dry-sown seed.—Ed.]

CO-OPERATION.—Mr. Pearce read a paper on this subject. It was essential in these times of low prices that the farmers should give serious consideration to the best methods of stopping leakages in the disposal of the products and in the procuring of implements and supplies necessary to their work. With too many of the improved machines of to-day, the costs between the maker and the user were so great that the price of the machine is enhanced to such an extent as to make it too expensive altogether. They heard a lot about the benefits of competition. On the one hand, it was to secure to the farmer the highest possible price for his produce; and on the other, to supply him with his requirements at lowest cost. As a matter of fact, however, the competition in the trade was of such a character as to reduce the price paid to the farmer for wheat, etc., and to enhance the cost of what he bought. Take the case of harvesters. There were to his knowledge nine separate firms engaged selling harvesters, the result being that the cost of the army of agents and others keeps the price of the machine at far too high a level. Then, in the wheat trade they would find seven or eight different firms in a single town competing for business that could be easily done by, say, two. All this unnecessary expense for offices, plants, salaries, etc., had to come off the price the farmer received for his wheat. The same applied in other directions. It would be infinitely better for the farmers to co-operate to buy and sell their requirements and produce with as little intervention of the middleman as possible. They had only to look to the wonderful results of the various Danish Agricultural Co-operative Societies to realise the possibilities of this work. It was very significant that some of the most successful of these societies were brought into existence in a small way to meet purely local needs. In Prussia the movement had also been very successful, and they might copy with advantage their system of storing wheat. There the farmers co-operate to erect grain stores at railway stations, with Government assistance. The grain is delivered direct from the thrasher, and the farmer who desires to do so can get advances on easy terms up to 75 per cent. of the value of his stored grain. This was very much cheaper than for each farmer to store in his own barn, and better than the local system of storing with the wheat-buyer, as in the latter case the farmer had no control over the grain. In Victoria the Railway Department were helping farmers by leasing frontages to the railway on which grain stores are erected. The Murtoa Co-operative Union was an instance of the value of local co-operation. There the membership fee was merely nominal, the Union taking no financial responsibility. By inviting offers for the requirements of the whole of the members in such matters as implements, manures, cornsacks, etc., better terms are obtained than each could get by purchasing individually. At the same time, when the price is arranged between the Union and the seller, the latter delivers direct to the member purchasing, and collects the money. In another direction a local co-operation might prove of great value. He firmly believed that by the use of high-class sires they could double the average value of their live stock. To obtain the sires of sufficiently good quality for the purpose was too heavy an expense for most of them as individuals; but by several neighbours co-operating the expense would not be heavy on each, and there should be no difficulty in arranging details. In many directions he thought small local unions could be worked in conjunction with the South Australian Farmers' Co-operative Union.

Riverton, March 21.

PRESENT—Messrs. A. J. Davis (chair), W. B. Davis, Malcolm, James, Gray, Camac, Badman, Longbottom, J. W. and J. E. Kelly, and Cooper (Hon. Sec.).

MANURES.—Mr. Badman expressed a preference for damp supers. He got better results from them than from drier makes. To make the super run well he mixed it with some dry, sifted, stable manure; about 60 lb. super to 30 lb. stable manure. Several members advised mixing bonedust with super at rate of 1 of the former to 10 of the latter. This had given very satisfactory results to those who had used it.

VETERINARY LECTURES.—This Branch decided to do all in its power to make proposed course of lectures at Riverton on "Stock Complaints," by Veterinary Surgeon Desmond, a success.

Mount Bryan East, March 18.

PRESENT—Messrs. T. Wilks (chair), E. S. Wilks, Teddy, Thomas, Dare, Quinn, B. H. K. and R. W. Dunstan (Hon. Sec.), and eighteen visitors.

STANDARD BUSHEL.—Considerable discussion on this subject took place. Strong exception was taken to the present system, and members expressed the opinion that if farmers would only co-operate they would be independent of the middleman in selling their produce, and would get better prices for it.

APPLES.—Mr. W. H. Quinn tabled a fine sample of Cleopatra apple, grown by himself without the aid of irrigation. To protect the trees from starlings, parrots, and crows he had found it necessary to cover them with wire-netting.

Millicent, March 2.

PRESENT—Messrs. McRostie (chair), Stewart, Lindsay, Holzgreffe, Stuckey, Hart, Oberlander, and Campbell (Hon. Sec.).

DOES WHEAT-GROWING PAY?—This subject was discussed, the opinion of the majority of members being that at present prices it did not pay to grow wheat year after year in this district; but, as a part of a rotation with other crops, it about paid expenses directly, and also benefited the land.

PESTS AND DISEASES.—Some discussion on bots in horses, and remedies for same; destruction of fruit by birds, etc., took place.

EARLY TOMATOES.—Mr. Oberlander read a paper on this subject.

Cherry Gardens, March 14.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Partridge, Hicks, Burpee, Curnow, Broadbent, Brumby, and Ricks (Hon. Sec.), and two visitors.

RABBITS.—Discussion took place on the increase of rabbits in the district. These vermin are doing a lot of mischief to crops, and it was agreed that simultaneous action on the part of landowners was necessary.

Balakiava, March 11.

PRESENT—Messrs. Robinson (chair), Black, Neville, Thompson, Tuck, Goding, Uppill, and Burden (Hon. Sec.), and one visitor.

GROWING FEED FOR STOCK.—Mr. H. Tuck initiated a discussion on "Does it Pay to grow Special Crops on the Farm for Feed?" He thought that it was advisable to grow some green stuff for the stock; but additional provision must also be made to carry stock over from April to July, when green feed is usually scarce. He advised saving all the wheat chaff, and conserving some straw to carry stock through the early part of the winter. A portion of the crop should be cut with the binder and headed; if the straw is chaffed, and fed with a little oats or molasses, the stock will do well. The more stock they could keep on the farm, the better. Members generally agreed with Mr. Tuck.

Mount Gambier, March 11.

PRESENT.—Messrs. Mitchell (chair), Smith, Vorwerk, Bodey, Barrows, Dow, Norman, Ruwoldt, Williams, Wilson, Sassanowsky, Wedd, Holloway, Edwards, Watson, Schlegel, and Collins (Hon. Sec.).

FODDER PLANTS.—Mr. R. Smith read a short paper on grasses and other fodder plants. His experience was that on his land cocksfoot grass was the best to sow. On the light hills and on dirty land it stood better than any grass he had tried, keeping green well into the spring, when the native grasses are drying off. Rye-grass gives a good return on heavier land; but with him it only lasted for one or two years. Lucerne gave him better results than any of the clovers; for making the lambs "prime" it was unequalled. In weedy land he would sow the lucerne in drills, about 8 inches apart, and dress with superphosphate. That would make it grow rapidly and smother the weeds. On clean land he preferred to broadcast the seed. He sowed seed in September, but thought it would be more profitable to sow in April. For an ordinary green crop on good land Cape barley was best; on lighter soil rye or Algerian oats were to be preferred. Rape gives a lot of feed, but care must be exercised in feeding it to stock. He would only sow it on land to be cropped with potatoes, as if sown before a cereal the roots would grow again in the latter crop. A lengthy and interesting discussion ensued. It was generally agreed that rye-grass was better feed than cocksfoot, but it was not suitable for the light and poorer soils. On good land Mr. Edwards said he sowed rye-grass mixed with Cape barley; the latter provided good green feed for the best part of the winter, and when it was done the rye-grass came on. The barley was broadcasted and harrowed in, after which the rye was sown and just brushed over with boughs, as care was necessary not to cover it too deeply. He had found lucerne a splendid success in holding light peaty soil inclined to drift. Mr. Bodey generally agreed with Mr. Edwards. He thought white prairie grass one of the best he had tried. This year he had good results from Elephant swedes sown in September last. He thought the land would fatten 30 to 40 sheep per acre. The turnips were sown in rows, 15 inches apart, and 1 lb. per acre of seed was sufficient. Several members suggested sowing rape in the spring, to provide feed during the summer and autumn. For green feed for pigs, Mr. Ruwoldt said Cape barley and vetches sown together could not be beaten. Two pounds of vetch and three-quarters of a bushel of barley per acre was enough to sow; if too much vetch seed is sown the plants will choke the barley. Mr. Sassanowsky reported that on sandy land he sowed Algerian oats, and let the sheep feed it down when it began to turn yellow. After being on the crop for about a week a large number of the sheep died.

IMPACTION IN CATTLE.—Mr. Williams, referring to the losses from this complaint, mentioned an instance where affected cattle recovered on being put on to rape. Then, at Kalangadoo, the trouble appeared to have been overcome by giving the cattle boneash mixed with sulphate of iron and salt. All authorities recommended phosphate of lime for cattle; this could be given as boneash (burnt bone) or as bonemeal. Ordinary bonedust might convey disease, besides being injurious in other ways; but where special meal was prepared by thoroughly steaming the bores there was no risk.

Port Elliot, February 18.

PRESENT.—Messrs. McLeod (chair), Wickman, Green, Welch, Hutchinson, Brown, W. E. and W. W. Hargreaves (Hon. Sec.), and several visitors.

ANNUAL REPORT.—The Hon. Secretary's report showed eleven meetings held, with average attendance of under eight members. Four papers were read by members, besides which several papers from *The Journal of Agriculture* were read and discussed. Messrs. W. E. Hargreave, H. B. Welch, and W. W. Hargreave were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

HOMESTEAD MEETING.—This meeting was held at Mr. O. B. Hutchinson's homestead at Hindmarsh Valley, and a very interesting time was spent in inspecting the orchard and garden. The appliances for raising water for irrigation came in for special attention. After the inspection, members were entertained at afternoon tea by Mr. Hutchinson, who was heartily thanked for his hospitality.

Hartley, February 17.

PRESENT—Messrs. Wundersitz (chair), Reimers, J. and T. Jaensch, Stanton, Kutzer, Pratt, W. and C. Brook (Hon. Sec.), and two visitors.

COMPLETE HARVESTER.—Considerable discussion took place on the season's experiences with the complete harvester and stripper, and it was generally agreed that the former machine would soon supersede the ordinary stripper, as it was a great saver of labour, and cost but little for repairs.

Eudunda, March 2.

PRESENT—Messrs. Walter (chair), Krummel, Gosling, Schwarz, Schiller, Sieber, Weil, Paech, Kluske, Von Bertouch, and Marshall (Hon. Sec.), and one visitor.

DAIRYING.—Mr. F. H. Walter read a paper on "Does Dairying Pay in this District?" He contended that dairying would not pay in this locality. There was usually little but wild oats and weeds in the pasture, and only for four months was this green. When the pasture dried off it quickly lost what little value it possessed, and the consequence was that unless they stall-fed their cows very liberally they produced very little milk, and soon got sickly. He had tried dairying under these conditions, and was satisfied that the cost and the labour involved in stall-feeding for about eight months of the year was too great. It was true that the class of cows kept in the district was inferior. This was mainly due to poor feeding and the use of inferior bulls. Most of the farmers appeared to think any sort of bull good enough. There were too many inferior bulls practically running at large; they were confirmed fence-breakers, and wandered about the district. The result was that they bred indiscriminately with the cows, and the farmer that kept a good bull, and tried to improve his cattle, had his efforts frustrated. Another drawback was that the heifers were got in calf too young, and never developed into decent-sized animals. It was quite a common occurrence for heifers to calve at one and a half to two years old. If anything was to be done to improve their cattle, these bulls should be confined or got rid of, and good animals obtained. He thought it would be a good plan for several farmers to co-operate to purchase a good bull, which should be kept in a well-enclosed paddock in a convenient centre. As it would be necessary to feed him well, a charge of 2s. 6d. for his services should be paid to the person under whose charge he was placed.

Wepowie, February 22.

PRESENT—Messrs. Gray (chair), Gale, Crocker, Smith, Bishop, Roberts, and Orrock (Hon. Sec.), and three visitors.

PICKLING SEED WHEAT.—Mr. T. Gale stated that last season he used both bluestone and formalin for pickling, but if anything the crop grown from seed pickled in formalin suffered more from leaf smut. The Chairman stated that his experience was similar. Two members stated that their crops on early fallow, which was in perfect condition for tilling operations when sown, were very badly affected by leaf smut. Members would like to know what has been the experience of South-Eastern farmers with this disease.

Elbow Hill, February 21.

PRESENT—Messrs. H. Dunn (chair), Rhen, Harvey, Elleway, and G. C. Dunn (Hon. Sec.), and ten visitors.

SOIL ANALYSES.—Some discussion on this subject took place, members being of opinion that a knowledge of the constituents of the soil would be of considerable advantage to the soil. An article on the inoculation of the soil with nitrogen-gathering bacteria was read and commented on.

RABBIT DESTRUCTION.—Farmers in this district find the rabbits a serious difficulty to contend with. Best results in poisoning had been secured by the use of sandalwood twigs painted with a mixture of flour, sugar, and strychnine.

Arden Vale, February 20.

PRESENT—Messrs. Warren (chair), Eckert, Pearce, Rogers, Klingberg, Willis, and Hannemann (Hon. Sec.), and seven visitors.

STANDARD BUSHEL.—Mr. E. H. Warren read a paper on this subject. He thought the farmers were indebted to Mr. Jno. Miller for his protest against the f.a.q. standard being fixed at 63 lb. this season. The whole system of fixing this standard required revision: but the remedy must come from within, and depends entirely upon the ability of the producers to organise for their own protection. The farmers were now beginning to see that under the present system—which does not pay extra for good quality, but always deducts for anything below—it was the height of folly to fix the standard high. Wheat weighing 61½ lb. to the bushel is realising 3d. per quarter less in London than 63-lb. wheat; but the local reduction on the 61½-lb. wheat would be 1s. per quarter. Surely it would pay the farmer to lose 3d. in London and gain 1s. here; but why in the name of fairplay is the buyer not satisfied with docking the farmer his actual loss, viz., 3d., instead of 1s. per quarter? The inference is that, up to a limit, it really pays the merchant to buy inferior grain, and the higher the standard the greater the profit to the buyer on the low-grade article. The standard in New South Wales this year is 59½ lb. to the bushel; yet that wheat is said to command only 6d. per quarter less than that of 63 lb. wheat. At the same time, the New South Wales growers obtain better local prices than the South Australian farmers. In Victoria they frequently noticed the same thing. He mentioned this to show that the alleged benefit to the farmer of their high standard was purely visionary. While the system of “docking” lasted, they must continue to agitate for, at any rate, a standard of 62 lb. to the bushel; but if extra quality is paid for, then the standard might be fixed at 63 lb. to the bushel. However, anything of this sort should, after all, only be of the nature of a compromise, till the much better method of grading the wheat and selling it as all other things are sold, according to quality, was introduced. Considerable discussion ensued, members agreeing in the main with the paper.

RABBIT DESTRUCTION.—Discussion on this subject took place. Mr. Pearce strongly recommended farmers to wire-net their farms, and to destroy the burrows and any other harbours inside the fences. A few good dogs would be found useful in keeping the rabbits down. Several members stated that they found the rabbits took phosphorised pollard better in the winter if laid in a furrow than in the summer. The difficulties encountered by the Kanyaka District Council in enforcing the Vermin Destruction Act were explained, and it was resolved that this Branch urges upon the Government the necessity for securing as speedily as possible an amended and workable Vermin Act.

Mundoora, February 17.

PRESENT—Messrs. Harris (chair), Tonkin, Loveridge, Shearer, Owens, and Mildren (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Some discussion on this subject took place, members generally favouring Mr. J. Miller's suggestion for two standards as being a considerable improvement upon the present system. Mr. Loveridge took exception to the system of docking, which was very unfair to the farmer. Members wished other Branches to support the proposal for two standards. Members had noticed the fact that South Australian wheat was realising higher prices in Great Britain than either Victorian or New South Wales wheat.

Minlaton, February 11.

PRESENT—Messrs. Mayer (chair), Correll, Parsons, Vanstone, Martin, Boundy, Anderson, Newbold, A. and J. McKenzie (Hon. Sec.).

BEST WHEATS FOR DISTRICT.—Considerable discussion on this subject took place. It was agreed that on dirty land early maturing varieties should be sown, and the use of rust-resisting wheat was recommended. It was also agreed that a change of seed from another locality was an advantage. Some members held that to keep good seed wheat from one season to sow the following year was as good as change of seed from another district.

Morchard, February 17.

PRESENT—Messrs. Scriven (chair), Reichstein, O'Loughlin, Barrie, Kitto, McDougall, and Beck (Hon. Sec.), and two visitors.

SEED WHEAT.—Discussion took place on the preparation of seed wheat. Mr. Reichstein stated that he removed the shaker from the winnower, and fixed a board about 6 in. in height to the top sieve to prevent the seed falling off. All the light and inferior grains were then blown out, and the pump, heavy seed remained on the sieve. Members generally approved of this method. In preparing bluestone pickle for the seed members preferred to dissolve the bluestone in cold water.

UTILITY OF THE BUREAU.—Mr. O'Loughlin read a short paper on this subject. In dealing with the question of the improvement of wheat, he referred to the necessity for farmers giving attention to this question.

HEAVY CROP.—The Hon. Secretary tabled photograph of crop of wheat grown at Hill River, and which averaged nearly 11 bags per acre.

Kanmantoo, February 17.

PRESENT—Messrs. Mills (chair), Lewis, Mullins, Thiele, E. and J. Downing (Hon. Sec.).

BRANCH WORK.—Some discussion on the poor attendance of members and the work of the Branch took place. It was decided to endeavour to secure additional members and also to impress on all the necessity for regular attendance.

RABBIT DESTRUCTION.—Mr. Mills stated that he had been distributing poisoned baits with the poison cart, and found it very effective and a great labour-saver.

CULTIVATION.—In reporting on harvest results, the advantages derived from fallowing and keeping the land worked during the summer were referred to.

Johnsburg, February 18.

PRESENT—Messrs. Masters (chair), Hombsch, Potter, McRitchie, Luckraft, Chalmers, and Johnson (Hon. Sec.).

HORSE COMPLAINT.—Members reported that at this season of the year in the North it was quite a common thing to find water continually running from the mouths of the horses. The trouble was attributed to the animals eating the dry squash bush, which apparently affected the digestive organs.

PICKLING SEED WHEAT.—Discussion followed the reading of an article from *The Journal of Agriculture* on the use of formalin as a preventive against leaf smut.

Gladstone, March 4.

PRESENT—Messrs. Goode (chair), Rundle, Sargent, Gallasch, Brayley, Odgers, Burton, and Wornum (Hon. Sec.).

PORT PIRIE CONFERENCE.—Delegates reported on proceedings of Conference, which they thought was one of the most instructive gatherings held in the district.

FORMALIN.—Members would like particulars as to the way in which formalin had been used in pickling seed wheat. Some members who had used one-fifth of a pound to 20 bushels of seed thought the pickle might have been too strong, but the plants which grew were particularly healthy. Owing to the risk of heavy losses members were loth to experiment with formalin to any extent. It was agreed that to be of any real value any experiments in this direction must be carried out in a systematic manner.

Mount Remarkable, February 16.

PRESENT—Messrs. Casley (chair), Challenger, Giles, W. J. and T. F. Smith, Foot, Yates, McIntosh, Morrell, Oldland, and O'Connell (Hon. Sec.).

SPARROWS AND STARLINGS.—Mr. Challenger stated that a friend of his informed him that a couple of laughing jacks in his garden kept it free from sparrows and starlings.

MARKETING PRODUCE.—Mr. Challenger initiated a discussion on this subject. He thought producers generally should be far more careful than they were in getting up their produce for market. This applied particularly to the export trade. They should send nothing but the best to European markets. An article of good quality will soon advertise itself, whereas the inferior goods injured the reputation of the State. The way in which eggs, butter, cream, etc., were sometimes forwarded to the market was simply a disgrace to the producers. It was impossible for the factory manager to make good butter from cream in bad condition, consequently the producer had to accept lower prices. To market produce in poor condition was suicidal to their own interests, and they would not see much improvement until the producers as a body realised this fact. If a bonus for high quality were given by buyers, he had no doubt that there would be greater efforts to secure the benefit of it. This applied particularly to wheat; most of what was sold on the 63-lb. standard would, if thoroughly cleaned, weigh 68 lb. per bushel, but as under present conditions the farmer would get no recompense for his labour in cleaning, he was hardly likely to go to the expense. Members generally agreed with Mr. Challenger's paper.

Bowhill, February 17.

PRESENT—Messrs. Dohnt (chair), Norman, Drogemuller, J. Waters, J. G. and H. Whitfield, and J. Waters, jun. (Hon. Sec.).

CROP REPORTS.—Mr. Norman reported a yield of 12 bushels per acre from Wilkinson's Early Wheat, manured with 80 lb. of super per acre; and 6 bushels from Dart's Imperial, manured with 40 lb. super.

HENS FEATHER-EATING.—Mr. Norman reported his Silver Wyandotte hens to have started feather-eating, and wished to know what caused this trouble. He found this breed very hardy, and stood the heat better than any other breeds he had kept.

CATTLE EATING POISONED RABBITS.—A member wished to know whether any injury would result if cattle ate rabbits that had been killed by phosphorised baits. Mr. Drogemuller reported an instance where seven cattle were lost from this cause. He believed a dose of carbonate of soda in water was useful for stock suffering from the effects of phosphorus poisoning. [Quite a number of cases of death as a result of stock eating the bodies of poisoned rabbits have been reported at different times.—Ed.]

CULTIVATION.—Mr. Dohnt read a paper on this subject. In a dry district like this, with an average of from 8 inches to 10 inches of rain, it was most important that the farmer should do everything possible to secure the absorption and retention of moisture in his land. He strongly believed in early fallowing; plough the land in June and July, to let the winter rains in. Where the soil does not drift too much, it should be well worked in September, and during the summer when moist. It was also necessary to get a good tilth before seeding operations commence. Seed should be sown in April or May in this district.

Dowlingville, February 16.

PRESENT—Messrs. Mason (chair), Montgomery, Phelps, Foggo, Crowell, and Lock (Hon. Sec.).

FORMALIN FOR PICKLING WHEAT.—The Chairman called attention to success reported by the Victorian Department with formalin as a preventive of leaf smut. Mr. Montgomery stated that last year he used formalin for pickling seed wheat. The crop was quite free from leaf smut (so-called black rust), and there was very little of the ordinary smut present. A small area was sown with seed pickled with bluestone; but the crop on this area was rather badly affected by smut.

Rhine Villa, February 18.

PRESENT—Messrs. Payne (chair), Schick, Lewis, Start, Mickan, W. T. and J. Vigar (Hon. Sec.), and one visitor.

SUMMER FODDERS.—Mr. G. A. Schick read a paper on this subject. The provision of summer fodder for their stock was an important matter, especially in this district, where the natural herbage was so deficient in the summer. Where it can be grown lucerne was superior to any other summer crop. He believed that on the flats along the different creeks in the district, where the land is not brackish and the water too far away, lucerne would do well. He advised sowing seed after first autumn rains, and keeping the land free from weeds during the winter. Mangels can be grown on drier land than lucerne. They require a deep loam, well worked and manured. As mangels require salt, their salt flats should prove suitable spots on which to grow them. The land should be worked deeply and thoroughly pulverised, and seeds sown in rows 3 feet apart, about the end of June. When a limited area is planted, dibble in the seeds about 18 inches apart. After the plants are up, keep the land well cultivated. During the summer the lower leaves may be gathered and fed to stock; but the roots should not be lifted until the plants show signs of running to seed. Dig the roots carefully, and avoid bruising them; pull off the leaves, and allow the roots to dry for a few hours. Then store them in a pit lined with dry straw, and covered with earth; they can be kept for several months in this way, if carefully handled. Other crops, such as sorghum, rape, mustard, vetches, etc., may be grown under favourable conditions; but the district was too dry as a rule. In addition to growing summer crops, they should conserve food as ensilage. On the Murray Flats this was of more importance than in many other districts; but nowhere was it more neglected. There were quite a number of places on the Murray Flats, especially along the watercourses, where there was quite a luxuriant growth of herbage during the winter. This, if cut, would make good ensilage. In other places crops might be grown to be cut for ensilage. Considerable discussion ensued, members being of opinion that without irrigation it was little use trying to grow lucerne on the Murray Flats, but mangels and kale would do fairly well if they received a little attention. Mr. W. Vigar tabled excellent specimens of mangels and lucerne.

Nantawarra, February 20.

PRESENT—Messrs. R. Nicholls (chair), Sleep, Pridham, Dall, E. J. and A. F. Herbert, Belling, Dixon, Bierwerth, and J. Nicholls (Hon. Sec.).

FORMALIN.—Mr. Dall reported having last season pickled two varieties of seed wheat with formalin, as directed in *The Journal of Agriculture*; but both crops were badly affected by black rust or flag smut, and one was also attacked by bunt.

COST OF WHEATGROWING.—The statement of Mr. Coghlan, the New South Wales Statist, that 7 bushels of wheat per acre in South Australia was more profitable than a 15-bushel crop in New South Wales, or a 20-bushel crop in New Zealand, was commented upon. No satisfactory explanation as to the accuracy of this statement, or the basis upon which it was made, was forthcoming.

Quorn, February 13.

PRESENT—Messrs. Thompson (chair), Rowe, Finlay, McColl, Cook, Brewster, Toll, and Walker (Hon. Sec.), and six visitors.

VISIT TO NEW SOUTH WALES.—The Hon. Secretary read an interesting account of a recent visit to the Young district of New South Wales. He was well satisfied with the prospects of that district, and quite a number of former residents of Quorn district were doing fairly well there. Much of the farming was done on the share system with the owner of the land. To secure good freehold land was a costly and difficult task. Mr. McColl tabled sample of Farmers' Friend Wheat from Young, New South Wales. This was grown by former residents of Quorn, and yielded 10 bags per acre in 1903 and 6½ bags last year. The soil on which it was grown was of a good chocolate colour, and of a friable nature.

Crystal Brook, February 11.

PRESENT—Messrs. Hamlyn (chair), Hutchison, Davidson, Pavy, Miell, Townsend, Billinghamurst, Solomon, Venning, Morrish, and Symons (Hon. Sec.)

BROKERS' CHARGES ON WOOL.—Mr. R. Pavy read a paper dealing with the charges made by the selling brokers on wool. The charges on small lots of wool were, in his opinion, exorbitant. The practice was to charge 4d. per lb., and 6d. in the pound sterling on sale price. In addition there was a deduction in weight of 1 lb. in every cwt.; this was called "draft." It is stated that in all 70,000 bales of wool were sold in the State during the past season; averaging the bales at 3 cwt., the purchasers received as a gift a total of 210,000 lb. of wool, which, at 7d. per lb., was worth £6,125. Besides this, the bales covering the wool were paid for by the seller; this represented an expenditure of £7,000, for which there was no return. In weighing the wool, allowance was made for the weight of the bale, and, in his opinion, at least 1 lb. more than was warranted was taken off the gross weight of each bale of wool. When they took into consideration the commissions paid to the selling broker, it would be seen that to the grower the selling of his wool was a very costly proceeding.

Bagster, February 18.

PRESENT—Messrs. Freeman (chair), Stiggants, C. and F. Brown, Payne, Basham, and Gravestocks (Hon. Sec.), and four visitors.

DESTRUCTION OF RABBITS.—Mr. C. Brown read a paper on this subject. In dealing with the subject of the best means of destroying rabbits, many points require consideration. The condition of the district, the weather, and the season of the year's operations are all important factors. At this season of the year in this locality poisoning was most effective. A little wheat mixed with the phosphorised pollard was an improvement on the pollard alone. In the hot, dry weather poisoned water is also an effective agent in rabbit destruction. In the wet season—and, in fact, at any time—wire-netting traps at the entrance of the burrows will largely assist in the work. One or two good dogs should be kept on each farm where rabbits are numerous, as they will keep down the increase during the breeding season. Whatever method was adopted, commonsense and thoroughness in its application were essential. Members generally favoured thorough poison with phosphorised pollard, and the filling in of the burrows in dry weather.

Utera Plains, February 18.

PRESENT—Messrs. Hornhardt (chair), Hale, Barrett, Guidera, W. and H. Chase, Venning, Watson, A. R. S., D. G., and A. R. Ramsey (Hon. Sec.).

CATTLE-BREEDING.—Mr. Guidera read a paper on this subject. He thought all the farmers should keep a few cows, if only to supply the requirements of the farm. For this locality he thought that for dairying the Jersey-Short-horn cross best. The purebred Jersey would produce more butter; but the animals were too small for working or killing; while the crossbred was not only a good milk producer, but was also a fairly large animal.

PASTURE.—Some discussion ensued on questions as to what grass seed could be sown with the wheat to provide pasture after the crop is harvested. Several members considered it inadvisable to sow any grass with the crop.

RABBIT POISONING.—Phosphorised pollard and strychnine were recommended by different members for poisoning rabbits.

SOCIAL.—It was decided that the next meeting take the form of a social gathering. Each member is expected to bring a visitor with him.

RAINFALL FOR 1904.—At Utera Plains, 8.54 in.; at Glynn, 8.95 in.

Penola, March 11.

PRESENT—Messrs. Darwent (chair), Stoney, McKay, Ricketts, Miller, Peake, Worthington, Alexander, McBain, and Allnutt (Hon. Secretary), and four visitors.

MANURES AND CULTIVATION.—Discussion took place on the necessity for manuring land for cereal crops. Members were agreed that while manures were profitable to use good cultivation was of greater importance in this district. In regard to fallowing, members preferred to cultivate rape, or some other fallow crop, to leaving the land out as bare fallow.

SPARROWS.—The heavy losses caused by the depredations of these birds were referred to, and members would be glad to hear of some effective way of dealing with them, the methods tried in this district having proved ineffective.

Orroroo, March 10.

PRESENT—Messrs. Moody (chair), Lillecrapp, Copley, Brown, Harding, Robertson, Oppermann, and Tapscott (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—Mr. W. T. Brown tabled the following samples of wheat in the straw, viz.:—Gluyas Early, Budd's Rust-resistant, Purple Straw, Marshall's No. 3, Rixon, White Tuscan, Dart's Imperial, and Lindsay No. 1. He placed Gluyas Early first, being one of the best wheats he had ever grown. Lindsay No. 1 and Marshall's No. 3 came next in the order mentioned. Dart's Imperial is very largely favoured in this district.

Petina Well, February 25.

PRESENT—Messrs. W. Penna (chair), R. and A. Penna, Giles, Johnstone, and Fiddaman (Hon. Sec.), and six visitors.

HARVESTING.—The Chairman read a paper on this subject, describing the methods in use in the early days and the improvements that had been effected. He considered that in the ordinary stripper there had been little real improvement during the past twenty years, but the harvester was a decided advance. It was, however, hardly suited for this district, as the draught is too heavy, and the presence of stumps in the fields caused too many breakages. Considering the price charged they are not the finished machines they should be. One great drawback was that the works were all behind the steerer, the consequence being that the spout that carries off the heads is liable to become choked without the steerer knowing until the chaff and rubbish come over into the wheatbox. In some machines the works were too cramped and awkward to get at, and the oiling parts could be greatly improved. Taking everything into consideration he thought the best system of harvesting was to bind the crop and thresh it with the header. One member thought this country too rough for the binder, while the harvester found little favour. Most were agreed that on the rough and sandy country the ordinary stripper was the best machine to use.

Calca, March 4

PRESENT—Messrs. J. J. Roberts (chair), W. J. Roberts, Wilcott, Thomas, Bowman, Plush, Freeman, Smith, and Newbold (Hon. Sec.), and one visitor.

DOES WHEATGROWING PAY?—This question was discussed at length. Members were of opinion that in this district wheatgrowing alone did not pay, but in combination with grazing the farmer could make a fair living.

MANURES FOR WHEAT.—Mr. Smith stated that, although he got satisfactory results from the use of super the first time he used it, later applications on the same land had been almost failures. The Chairman's experience had been the reverse. For three years in succession he had good results from super on the same block of land.

Denial Bay, March 4.

PRESENT—Messrs. Smith (chair), Starling, Hoffrichter, Dunnett, Lowe, McKenzie, Schmidt, and Gale (Hon. Sec.), and two visitors.

RED WORMS IN HORSES.—At request of members, Mr. T. Freeman attended, and described symptoms of complaint which had been affecting horses in this district. Altogether he had lost five animals, the disease being quite strange to him. His attention having been called to Veterinary Surgeon Desmond's article in the May, 1904, issue of *The Journal of Agriculture* on the horse disease at Aldinga, he studied this carefully, and, being satisfied that his horses were suffering from the same trouble, carried out the treatment recommended. He was pleased to say this had been effective, as since then he had cured five of his best horses. One of the worst features of this complaint, and its chief danger, was that the preliminary symptoms were very meagre. Once they became marked the disease was very rapid in its course until properly treated. He would, therefore, strongly recommend farmers to keep the required medicine on hand, and give it directly their horses showed signs of being affected by these worms. He thought that if sulphate of iron was mixed with the drinking water for the horses it would act as a preventive. The Hon. Secretary reported having lost a three-year-old filly recently, and on opening her he found the conditions the same as described in Mr. Desmond's report in the May issue of *The Journal*.

Whyte-Yarcowie, February 18.

PRESENT—Messrs. Dowd (chair), Faul, Mitchell, Mudge, Hunt, and Boerke (Hon. Sec.).

SEED WHEAT.—Some discussion on the harvesting of seed wheat took place. The Chairman held the opinion that wheat which had been threshed by the threshing machine did not germinate so well as wheat that was stripped. Members, having had no experience with threshed wheat for seed, could not express any opinion on this point.

Lyndoch, March 16.

PRESENT—Messrs. Kennedy (chair), Mitchell, Warren, Reu, Ross, Burge, Woolcock, A. and E. Springbett (Hon. Sec.), four honorary members, and one visitor.

WHEAT SAMPLES.—The Hon. Secretary tabled several samples of wheat, which had been submitted with a view to showing at the Adelaide Show. The samples were of very good quality, and regret was expressed that the Branch was not represented in the competition.

APPLES.—Mr. Reu tabled Dunn's Seedling and Dumelow's Seedling apples, which he had been informed were practically one variety. Members considered them quite distinct, the former being much the better apple.

Morchard, March 18.

PRESENT—Messrs. Toop (chair), Kitto, O'Loughlin, Kupke, Reichstein, Kirkland, Beck (Hon. Sec.), and two visitors.

PRIZE WHEATS.—Mr. Kitto explained the manner in which the wheat at the Adelaide Show was judged and weighed. Members could not understand how it was that some wheat exhibited at Adelaide, and which weighed 70½ lb. per bushel on Mark Lane scales, was placed at 68½ lb. to the bushel by the Show judges.

POULTRY.—The Hon. Secretary read a paper on this subject. He strongly advised farmers to pay greater attention to the improvement of the laying qualities of their fowls. This could be best brought about by the introduction of the non-sitting laying strains. He advised the use of Epsom salts and sulphate of iron during the summer, especially while the fowls are moulting. For diarrhoea he used dilute chlorodyne.

Colton, March 4.

PRESENT—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Hull, Whitehead, McBeath, Kleeman, Barnes, Inkster, and Packer (Hon. Sec.).

DOES WHEAT-GROWING PAY?—A long discussion on this subject took place. Members were agreed that at present prices they could not more than make ends meet by wheat-growing alone.

RABBITS.—Members reported these vermin very destructive in the district. One member stated that it cost him £100 per annum to keep the rabbits down on his farm.

Port Broughton, March 18.

PRESENT—Messrs. Whittaker (chair), Barclay, Button, Evans, Hoar, and Dalby (Hon. Sec.), and two visitors.

PORT PHRIS CONFERENCE.—The Hon. Secretary reported at length on the proceedings of this Conference. The papers and addresses were commented on, and the principal points referred to. A vote of thanks was accorded to Mr. Dalby for his interesting report.

Wilson, March 18.

PRESENT—Messrs. Harrison (chair), Meyer, Hilder, Barnes, Need, Nelson, Logan, and Neal (Hon. Sec.).

SEEDING.—Mr. Need initiated discussion on this subject. Every effort must be made to do this work as economically as possible, consistent with good work. As soon as harvesting is finished, ploughing should be pushed on. No hard-and-fast rule can be set down as to date to commence seeding; but he would advise commencing with the later varieties about the middle of March, sowing the early sorts on the fallow in April. He would prefer to drill all the seed in; but if this cannot be done, he would cover it with the cultivator, or scarify and harrow it twice. He considered it unwise to crop the same land for more than two seasons running. Members generally favoured harrowing the land after sowing, but Mr. Logan would leave it rough until about August. For stubble land shallow ploughing was recommended. It was agreed that the two classes of soil in this locality, viz., the "red land" and the "white land," required very different working. Members thought it would pay to use manure on the "white land," and one member agreed to try some super as an experiment. Mr. Need asked whether clean fallow would require to be worked again before seeding. Members thought that if the soil was moist it would be beneficial to stir it again; but if dry, no further working was advisable.

Booleroo Centre, March 21.

PRESENT—Messrs. Brooks (chair), Michael, Repper, Steven, Sargent, and McMartin (Hon. Sec.), and one visitor.

FERTILISERS.—Dr. Steven read a paper on this subject. He quoted analyses to show that a 30-bushel wheat crop removed 34 lb. of nitrogen from the soil, 14.2 lb. of phosphoric acid, and 9.3 lb. of potash. It was thus seen that the greatest drain was on the nitrogen in the soil. He indicated the various other constituents of the wheat plant, and the manner in which these were obtained. Although nitrogen was ever present in the atmosphere, the plant could not obtain its supplies from the air; but it was most probable that relatively large quantities were carried into the soil by rain, and there converted into a form in which the plant could take it up, hence the value of early fallowing. Phosphoric acid was largely drawn upon, and experience had proved the necessity for supplying this artificially. Dr. Steven quoted from Rothamsted experiments, showing the exhaustion of the soil brought about by continuous cropping with cereals. Considerable discussion ensued. Several members expressed the opinion that, owing to the differences in climatic and soil conditions, the results of experiments carried out in Europe could not be accepted as a reliable guide to what would happen in this country.

Gawler River, February 17.

PRESENT—Messrs. A. M. Dawkins (chair), H. Dawkins, Day, Baldwin, Parker, Kreig, H. and F. Reodiger, Hillier, and Leak (Hon. Sec.), and three visitors.

IMPROVEMENT OF HORSES.—Mr. H. Dawkins read a paper on this subject. Before they could improve the breed of any animal they must first find out what that breed really consists of, and exactly how it stands in relation to other breeds. The heavy horse of South Australia, from the very commencement, started on a wrong basis, inasmuch as the farmers only had a light class of mare to breed from; and even up to the present day all the lighter breeds were intermingled with the heavy breeds. This, he thought, accounted for the lack of bone, and the disappointment so often experienced with breeders, for only in a few instances have they the purebred animal without any infusion of the lighter sorts; but where it exists they would find bone equal to anything in the world. To improve the present state of affairs he would suggest, amongst other things:—1. The formation of a stud book on the same lines as is done in the old country. 2. That before a horse can secure a prize at an agricultural show he should be passed by a veterinary surgeon. 3. That prizes should be given in proportion to the value of the animal to the State. 4. There should be a fixed type of horse. 5. They should have a stallion tax. In the first place, then, the formation of a studbook would give breeders some definite object to breed for, and it would give South Australian horses a better standing in the eyes of other countries. He would propose that five of the leading breeders be appointed to arrange the book in relation to the present South Australian horses, and then open a book for Shire, Suffolk, and Clydesdale horses, so that importers would have something to go upon. If, as is the case in England, before a horse secured a prize at their agricultural shows, he had to be passed by a veterinary surgeon, everyone would know whether he was breeding from a sound horse, and so practically only sound horses would be bred from. If a better prize was given to these horses, it would encourage a higher standard of breeding, and would be worth while farmers showing their stock, and striving to breed show stock; and, while the Government is giving a grant to these shows, he maintained that they should see to it that that money is spent in the most useful way. Four pounds for a hunter against £1 for a draught mare is all out of proportion. If a society wishes to run a fair, all well and good; but while it has taxpayers' money the best use that is possible should be made of it, and to give the prize to half-bred brutes, as hunters are, is not doing this. Then they needed a fixed type. Of course, the studbook will do this; but he would like to know what the community really wants. The majority imagine they require a half-bred animal to do fast work. Where this kind of animal is wanted, let them go in for the Suffolk, and not breed mongrels. The first cross is no doubt all right, but after that they could breed nothing reliable. The following abridged description is given by one authority in relation to the three leading English breeds:—“*The Shire Horse*.—Black, brown, or bay most desirable colours; 17 hands high; head long and lean, profile slightly arched, broad between the eyes; shoulders oblique, sprung well into the back; very wide chest; ribs wide and deep, with little space between last rib and hip; feet large, with wide heels; legs short from knee to pastern, with long, silky feather; pasterns rather short, tassels of hair at lip, knee, and hock. The animal generally is large and massive, crosses well with Clydesdale; differs by having the muscles larger, quarters shorter, pasterns shorter, and hoofs more upright, and in being more sluggish in action. *Clydesdale*.—Prevailing colours, brown, bay, and black (roan and chestnut avoided); height, 16½ hands; much the same build as the Shire. These horses have strong constitutions, free action, are high mettled (but free from vice), and fast walkers. *Suffolk*.—Colour, chestnut; height, 16 hands; finely arched necks, low shoulders, and thick on withers, deep round barrels, well-developed quarters, legs rather light, round in bone, free from hair, feet small, suitable for work on clay lands, very quiet and docile, and willing pullers.” The last appears to answer the requirements of the average farmer; but for himself he preferred the pure Clydesdale. What he advocated specially, however, was for farmers to use the purebred animals in preference to crossbreds and mongrels. Finally, he advocated an annual tax of £10 upon every uncastrated horse over 1½ years old. This would mean that they would pay a little more for the service of good horses; but it would put a stop to weeds travelling at a very low figure, and they would be the gainers in the end. Considerable discussion ensued, and the following resolutions were carried:—

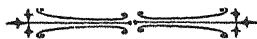
"1. That this Branch is in favour of a studbook for each of the breeds of draught horses being established by the Department of Agriculture." "2. That all stallions exhibited at shows should be required to submit to a veterinary examination for soundness." Members strongly condemned the action of various agricultural show committees in allotting high prizes for classes of horses of no real value to the general public.

Bagster, March 18.

PRESENT.—Messrs. Freeman (chair), Roberts, Hayes, E. C. and F. C. Brown, and Gravestocks (Hon. Sec.), and four visitors.

PREPARATION OF LAND FOR SEEDING.—Mr. F. C. Brown read a short paper on this subject. He advocated fallowing the land early, before the grass and other herbage has started to seed. He would plough 5 inches or 6 inches deep, and cross-harrow. The land must be kept free of weeds during the spring, and before seeding should be shallow-ploughed or cultivated again. In some cases harrowing behind the drill will be found beneficial. Poor cultivation will not pay. Members were agreed that fallowing should, if possible, be finished in July, and the land well worked afterwards. On new land or stubble in this district it was not advisable to plough more than 3 inches deep.

FORMALIN.—The Chairman reported having obtained 50 lb. of formalin for trial by members.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

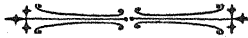
Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from February 25 to March 29, 1905.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	45	97	150
Carpenters	2	—	1
Masons and bricklayers	—	—	3
Plasterers	—	—	3
Painters	2	1	—
Blacksmiths and strikers	4	2	4
Fitter and turner	1	—	—
Enginedrivers and firemen	1	1	—
Compositors	3	—	27
Bullock driver	—	—	1
Saddlemaker	—	1	—
Cook	1	—	—
Apprentices	10	3	1
Cleaners	17	9	6
Porters and junior porters	9	14	2
Rivet boys	4	—	2
Totals	99	128	200

March 30, 1905.

A. RICHARDSON, Bureau Clerk.



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RICHARD BUTLER,
Minister of Agriculture.

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GENERAL NOTES.

The Agricultural Department.

Recently the Hon. Minister of Agriculture (Hon. R. W. Foster) held an important conference with the Professor of Agriculture (Professor Angus) and the Principal of the Roseworthy Agricultural College (Professor Perkins) in reference to the future working of the College Farm and experimental plots. After discussing the whole matter, and with the full concurrence of the two officers, the Hon. Minister has arranged that the work shall be carried out under their joint control. Seedling operations are in full swing at the College Farm, and an important scheme of experimental work, on more extended lines than have hitherto been attempted, is being elaborated by the two responsible officers.

Roseworthy Agricultural College.

The first session of the new year at Roseworthy Agricultural College opened on Wednesday, April 26. There are now 56 students enrolled, and the College accommodation is taxed to its utmost capacity. A number of minor improvements have been effected at the College during the vacation.

Roseworthy College Scholarships.

Every year six scholarships at Roseworthy Agricultural College, tenable for three years, are offered for competition. The main object of these scholarships is to give country lads whose parents could not otherwise afford to send them to the Agricultural College an opportunity of obtaining instruction in scientific and practical agriculture. To better attain this object the State is divided into six districts, one scholarship being offered for each district. It is, however, to be regretted that so few competitors from the country enter for the scholarships. At the recent examinations nine candidates presented themselves, six being in district No. 1, representing Adelaide and the municipal corporations in the vicinity. The scholarship in this district was won by Fred. Keith Watson, of Plympton; in No. 2 district by John Carey Buttfield, of Pewsey Vale; in No. 5 district by William Christian Kuhne, of Roseworthy; and in No. 6 by Stephen Chestle Billinghamurst, of Merriton. The vacant scholarships in districts 3 and 4 were awarded by the Hon. Minister of Agriculture to Messrs. Osmond John Howard and Edward James Clarke, who qualified in district No. 1.

South Australian Fruit for Brisbane Show.

The Department of Agriculture and the South Australian Fruit-growers' Association are co-operating in forwarding a collection of South Australian grown fruit, to be shown at an exhibition which will be held under the auspices of the National Agricultural and Industrial Association of Queensland, in Brisbane, during August next. The Department

has collected a splendid lot of apples, pears, and grapes, which have been donated by several members of the Fruitgrowers' Association. Mr. Quinn has wrapped and packed the fruits in trays, and they are now being kept in cold storage until the time arrives for dispatching them to Brisbane. The Department of Agriculture will also enter an exhibit of apples for a trophy which is offered for interstate competition by the same Association, and Mr. Quinn is now procuring the necessary quantity of the varieties most likely to keep in good condition until August.

Imports and Exports of Fruits and Plants.

During April the Inspectors under the Vine, Fruit, and Vegetable Protection Act at Adelaide and Port Adelaide admitted 4,652 bushels of fruits and 40 parcels of plants. From these, 316 bushels of overripe fruits were destroyed, and 5 parcels of plants detained pending the arrival of the necessary declarations required by law. Nearly all of these fruits consisted of Queensland bananas and pineapples; the plants of small garden products of an ornamental character. The exports dealt with by the officers consisted of 14,097 bushels of fruits, 20 parcels of plants, and 3,113 packages of vegetables. Of the fruits 5,710 cases contained grapes in transit for the eastern States, while 2,446 cases of apples and pears were tested respecting their suitability for export to Europe and South Africa. In connection with these quantities it should be explained that they apply only to interstate exports to Victoria, New South Wales, and Queensland, and to the fruit submitted by two or three oversea exporters. The shipments to Western Australia and the bulk of the European shipments are not seen by the Inspectors prior to shipment.

Transplanting Fruit and other Trees.

Under the conditions prevailing in the average fruit-growing district of South Australia root action does not cease over a long period during the winter season. Although no definite tests have been recorded, this dormant period appears, from ordinary observations, to be confined to portions of the months of June, the whole of July, and a certain part of August, in the open country, from Adelaide northwards. The South-Eastern and Mount Lofty conditions, of course, vary, and doubtless the period of rest is more prolonged in those parts. If the soil is ready for receiving them, deciduous trees, such as apples, pears, peaches, apricots, plums, etc., should be set out during this month (May). The soil is yet warm enough to cause the roots which have been mutilated in the lifting from the nursery bed to send out a lot of fresh young roots before the whole system sinks into its winter rest. Any one who has not tried this may raise doubts when he recalls that no further extension of the portion of the tree above ground takes place after the leaves begin to fall. But let the doubter "heel" a lifted tree in now, and carefully take it out again six weeks hence, and the proof will be forthcoming. Such a tree as

may be set out now is ready in spring with a root system fully equipped for the absorption of liquid nourishment from the soil. In our short spring, the latent energies of the tree are aroused with almost sudden power by the great solar energy which operates directly the cloudy days are over, and transpiration from the foliage is enormous. With the shattered and unprepared root system which a midwinter transplanted tree possesses the supply from beneath is not equal to the strain placed upon it by this transpiration. The current of moisture is inadequate, and the growth which began with great promise is checked for some time. Do not be afraid to lift the nursery stock because the leaves have not fallen or on account of the tips of the twigs being apparently unripe. Such leaves have practically completed their life work, and the terminal twigs will be pruned away after the trees are set into the orchard. In transplanting, make the positions or holes to fit the roots and not the roots to fit the spaces. Rather prune long roots back than bend them around against the walls of the hole. When set in position, cover the roots with finely broken, good soil, and press it into contact with them with the foot. If well moistened, no water need be applied, but if still dry, a bucket of water should be poured around each tree. Excepting in warm places it is getting late to transplant citrus trees, but where frosts are rare it is yet safe to shift them, providing a good ball of earth surrounds and holds the roots together. These should always receive a watering after being set out. Ornamental trees and shrubs may also be set out with great advantage at this period of the year.

Peach Aphides (*Myzus cerasi*, Fabr.).

There is a common belief that this pest lives upon the roots of the trees throughout the winter. Although we have searched for evidence at various times we have not found these insects away from the bole of the stem below the ground surface, but we are in a position to state from actual observation that the gravid females may be found upon portions of the trees above ground throughout the winter months. A correspondent states that he has been troubled on some trees right throughout this summer, hot as it has been. The best spray wash is probably the old, well-tried tobacco and soap mixture. A strength of one ounce of strong tobacco and 4 oz. of common soap, in four gallons of water, has proved effective with the writer, but it was applied warm. The success obtained by pouring solutions around the stem of the tree during winter was probably due to the insects being collected there, and it is to be recommended as an auxiliary means of destruction. We have long expressed the opinion that ultimately in commercial orchards this pest will be destroyed by fumigation methods. We first demonstrated the effectiveness of this method about eight years ago with potassium cyanide fumes. Fumes made by burning damp tobacco waste under a tent have also proved deadly to this insect.

The Spencer Seedless Apple.

Much interest has been aroused in horticultural circles respecting this fruit, and not a little condemnatory criticism has been hurled against Spencer's creation and the writer who boomed it. While we deprecate the action of those who would delude, or attempt to delude, planters into placing much faith in such so-called novelties to the neglect of varieties of well-proved worth, we also refuse to be classed with those who assail such introductions in unmeasured language. The journalist who essays to dilate upon the wonders of scientific work usually oversteps the mark by reason of his lack of power to discriminate between the correlative values of certain phases of the subject under treatment. To affirm that an apple will be proof against an insect which at a certain stage in its metamorphosis devours—if it has a chance—the carpels of seeds, if there be no seeds present, is attributing a degree of foresight and reasoning to the insect which up to the present, at any rate, there is no evidence to show has been evolved. In the knowledge of the great value to the horticultural world of seedless sultana and currant grapes, and practically seedless oranges, we are quite prepared to accept Spencer's seedless apple as a variety worthy of a fair trial, but the mere fact that it may be free from seeds does not constitute all that is needed to induce us to re-graft or grub up all our apple trees as at present grown. A seedless apple of inferior flavour and poor keeping qualities is of little value to us. The report that in London single specimens of this much-boomed curio—for seedless apples are not to be classed as complete novelties—fetched unheard of prices, stands for very little to the commercial fruitgrower, though it may mean much to the enterprising company which, naturally, is desirous of selling young trees of the seedless variety.

Export of Canned Eggs.

A good deal has been heard lately about the possibility of developing an export in egg pulp, or canned eggs. Two shipments were made from Queensland recently. One consisted of 12 tins, and the other of 26 tins. The eggs were purchased by the shipper at 4½d. to 4¾d. per dozen, and the prices realised in London were 4¾d. per lb. and 5d. per lb. respectively. After payment of cost of eggs, freight, and other charges, the smaller shipment resulted in a loss of £4 10s., and the other of £5 7s. In reporting on results the London agents stated that the shipment arrived too late, and that better prices would be realised about Christmas. A recent shipment of frozen eggs from Victoria also resulted in a loss, and it seems evident that the Australian poultry farmer will have to accept lower rates for his eggs before any large business in the export trade with England can be developed.

The Season.

Over the greater part of the agricultural areas the season has opened very auspiciously. The summer proved unusually dry, and in many dis-

tricts water, both for stock and for domestic purposes, was in short supply, and good rain six weeks or more ago would have been welcomed. In addition, those sheepowners whose ewes were lambing desired early feed; but, taking it altogether, it is very doubtful whether March rains do not, as a rule, do more harm than good, as, unless followed up by rain early in April the grass starts and gets a severe check, while much of the early sown wheat may malt. Such a soaking rain as experienced this Easter will in most districts bring on the feed, and will ensure good germination of the crops on well-prepared land. Seeding is being pushed on vigorously throughout all but the latest districts.

EXPERIMENTAL CULTIVATION, WORK FOR SEASON 1905-6.

The following is an outline of the experimental work now being undertaken by the Department of Agriculture in co-operation with members of the Agricultural Bureau.

MANURES FOR WHEAT.

Two series of experiments are being carried out in this direction:—

1. *Complete v. Incomplete Manures.*—In this series 1 cwt. per acre of mineral superphosphate is taken as a standard, and one plot is treated accordingly. In addition to the super, one plot receives nitrate of soda, one sulphate of potash, and another both nitrate of soda and sulphate of potash. The latter plot receives a complete manure, that is, it is supplied with the three principal plant foods. Other plots receive—(1) Bone super; (2) nitrate of soda and sulphate of potash; and (3) a dressing of lime some weeks before the mineral super is applied. This work is being undertaken at Strathalbyn by Mr. P. A. Cockburn; at Saddleworth, by Mr. F. Coleman; at Port Lincoln, by Mr. C. Ridgway; at Minlaton, by Mr. J. McKenzie; at Gladstone, by Mr. C. Goode; at Balaclava, by Mr. W. A. Robinson; at Wilmington, by Mr. J. Schuppan; at Rhine Villa, by Mr. John Vigar; and at Virginia, by Mr. J. E. Taylor.

2. *Soluble and Insoluble Phosphates.*—Some of the most prominent authorities on agriculture hold that it is not always advisable to apply the whole of the phosphatic dressing in an immediately available form, especially in the case of root crops. To test this point, so far as it applies to wheat, experiments with the different forms of phosphates are being carried out by Messrs. W. G. Mills (Native Valley), W. R. Richardson (Koppio), F. Roediger (Gawler River), and G. A. Vigar (Springton). The same amount of phosphoric acid is to be applied to each plot, but the weights of the manures vary. On one plot all the phosphate will be applied in an immediately available form (38 per cent. water-soluble mineral super); on another the phosphate will be wholly insoluble in water, but partly soluble in citrate of ammonia; while on other plots both water-soluble and acid-soluble forms are applied. These tests are

to be carried on for two or three years on the same land so as to determine not only the immediate effect of the different dressings, but the after effects also.

MANURING HAY CROPS.

Experiments with complete and incomplete manures for hay crops will be carried out in three districts. These tests will also include a comparison of the results from nitrate of soda and sulphate of ammonia and from kainit and sulphate of potash used in conjunction with other manures.

BARE FALLOW *v.* FALLOW CROP.

At Aldinga, Mr. T. Pengilly will continue the experiment, started last year, of growing rape on the land intended to be cropped the following year, instead of leaving the land as bare fallow. The land in crop with wheat last year was manured with different dressings, while the paths between the plots were sown to peas. This year rape is being grown, and the after effects of the different manures may show some interesting results in the rape crop.

TESTS OF VARIETIES OF WHEATS.

In this series the main objects to be tested are—(1) A general comparison of the yields of a number of wheats in the same district, as well as in different localities; (2) a comparison of the resistance to rust of certain varieties; and (3) a comparison of the aggregate yields over a period of years of the best of our rust-resisting wheats with those of varieties classed as rust liable. In addition, these experiments will afford material for valuable work in determining the effect of locality on the flour strength of different wheats. These tests are being carried out as under:—At Brinkworth, Mr. A. L. McEwin, 15 plots; Caltowie, Mr. F. Lehmann, 20 plots; Lipson, Mr. E. J. Barraud, 12 plots; Nantawarra, Mr. T. Dixon, 13 plots; Strathalbyn, Mr. P. A. Cockburn, 14 plots; Bews, Mr. R. Barr, jun., 13 plots; Koolunga, Mr. J. Sandow, 16 plots; Rhine Villa, Mr. J. Vigar, 12 plots; Denial Bay, Mr. W. O. Gale, 12 plots; Virginia, Baker Brothers, 12 plots; Morgan, Mr. R. Wohling, 12 plots. The principal varieties being tested, and the number of plots of each are as follows:—Gluyas, 11; Marshall's No. 3, 11; Yandillah King, 10; Comeback, 10; Carmichael's Eclipse, 10; Federation, 8; Nhill, 8; Purple Straw, 7; Petatz Surprise, 7; Gallant, 7; Dart's Imperial, 7; Jonathan, 6; Silver King, 6; and Bobs, 5. In addition, 14 other varieties are being grown in one or more localities, at the special desire of the person undertaking the work.

MANURES FOR BARLEY.

At two localities on Kangaroo Island experiments with manures for barley will be carried out.

MANURES FOR POTATOES.

Arrangements are in progress for experiments with manures for potatoes in six different localities.

FORMALIN FOR PICKLING WHEAT.

The value of a solution of formalin as a pickle to destroy the spores of bunt and flag smut on wheat will be tested. These tests will cover the effect of different strength solutions—(1) On the germination of the grain; and (2) on the spores of the diseases mentioned. Different methods of pickling will also be tested.

NITROGEN-GATHERING BACTERIA.

Through the courtesy of the United States Department of Agriculture, "cultures" for peas and red clover have been received. Arrangements are in progress for experiments at Gumeracha, Mount Gambier, Millicent, Kybybolite, and Lucindale. These will be carried out under the personal supervision of the Professor of Agriculture.

The whole of this experimental work has been entrusted to members of the Agricultural Bureau, and all the cereal tests will be carried on for several years in order to secure reliable results. The cereal experiments will be duplicated at Kybybolite Farm and, if possible, at Roseworthy.

AN EXPERIMENTAL FARM FOR THE SOUTH-EAST.

Our readers, especially those in the South-East, will doubtless be pleased to learn that the Government has set apart 1,000 acres of the Kybybolite Estate—including the homestead—as an experimental station to be controlled by the Department of Agriculture. It has long been recognised that South-Eastern conditions were so different from those prevailing at Roseworthy that the result of work carried on at the College Farm could not be accepted by the South-Eastern farmers as a guide in their operations. As the climatic and soil conditions of Kybybolite are fairly average of a large area of this portion of the State, the results obtained there should have a distinct bearing on farm practice throughout the South-East. The rainfall will, of course, permit of greater diversity of crops being grown than is possible at Roseworthy, and in many directions work which will be of great value to landholders throughout the State can be undertaken.

No time will be lost in putting a portion of the block under cultivation, the work of clearing and breaking up the land having already been put in hand. A practical South-Eastern farmer has been appointed as working overseer for the present.

To afford to farmers' sons who cannot take the three years' course at Roseworthy an opportunity of receiving from the Professor of Agriculture and the departmental staff instruction in practical and commercial agriculture, "farm pupils" will be accepted at Kybybolite. Details of the work to be carried out and the conditions under which such pupils will be accepted will be published in a future issue. Meantime any information on the subject may be obtained on application to the Secretary for Agriculture, Adelaide.

FARM ACCOUNTS.

By FRED. W. RUSSACK.

Many of our successful farmers make it their boast that they have never kept any kind of accounts whatever. For them the following remarks are not intended. "You can't teach an old dog any new tricks"; but some of the farmers of the new generation may not be adverse to receiving a few hints as to the improvement of their business methods.

It is a strange thing that farmers are never classed as business men. The reason is probably found in the fact that farmers as a class are remarkably careless in respect to the keeping of accounts. It is, indeed, their besetting sin. I cannot conceive why a man who buys sheep, feeds them, and sells their produce, is not just as much a business man as he who in turn buys and sells the wool taken from their backs. There is, however, a very great difference between the business methods of business men and the business methods followed by the majority of farmers. It is only too evident that if the merchants of Adelaide were as careless in respect of recording their transactions as many of our farmers are they would figure in the Insolvency Court within twelve months.

A farmer told me the other day that thirty years ago he started on the land with £10 in his pocket, and that, though he never troubled his head about keeping any accounts, he is to-day worth £15,000—all made out of farming. We know that other farmers can tell somewhat similar stories. We also know that from thirty to twenty down to even ten years ago scarcely any vocation offered such chances of reasonable success as farming in the more favoured portions of this State. But the conditions under which those engaged in the rural industries operate are changing with the times. Competition is becoming keener and fiercer; land values are rising; and concurrently the agricultural interest is being more and more beset with difficulties. In fact, there is, nowadays, perhaps, no line of business more intricate; no line of business that gives employment to more intellect, or intellect of a higher order, than *successful* farming.

To keep abreast of these changed conditions our farmers are feeling the necessity of radical changes in their business methods. Not only must the successful farmer be a good salesman and a good purchaser; but, as a business man, he must follow the devices of other classes of business men. The latter invariably make a practice of permanently recording their belongings and their transactions.

The keeping of a simple but effective system of accounts offers the most substantial advantages to the farmer no less than to the commercial man. Let us consider a few of them:—

1. His books tell the farmer the exact extent of his assets and liabilities at the end of the year's operations.

2. His accounts enable the farmer to determine where and how his gains are made and his losses incurred.

3. The farmer consults his books to find whether his capital and energies could be more profitably employed in one direction than in another; whether his crops or his sheep or cattle give him the best returns.

4. Systematically kept accounts enable the farmer to readily meet the demands of the Commissioner of Taxes for statements of the sources of his income and expenditure.

5. Without efficient books, farmers cannot successfully appeal against the assessment of their income for taxation purposes.

6. Under the Bankruptcy Act, inability to produce books of account is taken as evidence of carelessness, and counts against the insolvent.

7. A book of original entry is accepted in law courts as evidence of the sale and delivery of commodities and of services rendered.

With a view to placing these and other advantages within their reach, I have been requested by the Editor to frame a system of keeping accounts suitable to the needs of farmers. In trying to comply with the request I foresee two difficulties, viz.:—

1. That of meeting the exact requirements; and

2. That of suiting the capacity of so large and varied a class as the farmers of this State.

I deem it advisable to address myself first to such of them as have no knowledge whatever of the technicalities of bookkeeping. In future articles, therefore, I shall begin by outlining a method of keeping farm accounts simple enough for use by those who can write legibly and do a little reckoning, but yet effective enough to afford a complete record of an average farmer's receipts and disbursements; of his assets and liabilities.

(To be continued.)

"JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,
Adelaide.

HAWKESBURY EGG-LAYING COMPETITION.

The following particulars concerning the results of the third egg-laying competition conducted at Hawkesbury (N.S.W.) Agricultural College are obtained from *The Sydney Daily Telegraph* :—

RESULTS OF COMPETITION.

The following table shows the number of eggs laid each three months by the 20 leading pens. Altogether 100 pens of six birds each took part in the competition, which lasted from April 1, 1904, to March 31, 1905 :—

Breed.	Owner.	Eggs Laid During					Money Value of Eggs for 12 Months.
		April May June	July Aug. Sept.	Oct. Nov. Dec.	Jan. Feb. Mar.	Total for 12 Mons.	
Silver Wyandotte ...	G. Howell ...	269	305	344	306	1,224	£ s. d. 5 13 10
White Leghorn ...	J. Lowe ...	165	338	412	278	1,193	5 1 9
R.C. White Leghorn ...	J. M. Anderson (America)	180	334	366	299	1,179	5 13 10
White Leghorn ...	T. J. Brierley ...	134	349	451	237	1,171	4 17 2
Black Orpington ...	Mrs. E. Scaysbrook ...	228	367	313	247	1,155	5 4 2
White Leghorn ...	S. Ellis ...	116	312	395	297	1,120	4 13 0
White Leghorn ...	V. J. Zahel ...	16	329	432	339	1,116	4 9 1
White Leghorn ...	A. J. Kyne ...	123	364	373	243	1,103	4 14 1
White Wyandotte ...	Oceanside Poultry Farm (America)	170	327	348	256	1,101	4 15 3
Golden Wyandotte...	W. H. Peters ...	247	347	290	211	1,095	5 0 3
White Leghorn ...	J. Potts ...	163	290	417	221	1,091	4 12 4
White Leghorn ...	Mrs. J. J. Roche ...	115	272	393	311	1,091	4 12 4
Black Orpington ...	Royal Poultry Farm	211	310	317	241	1,079	4 17 4
Black Orpington ...	C. Bridekirk ...	180	303	344	251	1,078	4 11 0
Brown Leghorn ...	F. J. Bowney ...	70	341	399	264	1,074	4 5 0
R.C. Brown Leghorn ...	Mrs. A. H. Hansel (America)	262	305	324	180	1,071	4 19 3
Black Orpington ...	W. Cook ...	142	293	341	291	1,067	4 12 1
Rhode Island Red ...	Dr. J. Martin (America)	236	273	292	255	1,056	4 8 7
Black Orpington ...	W. Wild ...	131	292	369	257	1,049	4 11 1
Black Orpington ...	A. Wedlech ...	116	309	339	281	1,045	4 10 8

It will be seen that there are great differences in the positions of the pens in regard to number of eggs laid and value of eggs.

COMPARISON OF BREEDS.

A comparison of the average egg production and the average value of the eggs per hen of the various breeds is instructive and interesting. As a guide, however, to the relative merits of the different breeds, no significance can be attached to the positions occupied by varieties in which

there were only one or two pens competing. The following are the analyses:—

Breed.				Per Hen. Eggs.	Per Hen. Value.
					£ s. d.
6	Rosecomb Brown Leghorns	...	...	178·50	0 16 6
6	Rhode Island Reds	...	...	176·00	0 14 9
96	White Leghorns	...	...	166·23	0 13 7
12	Black Hamburgs	...	...	163·83	0 13 9
6	Anconas	...	...	163·66	0 12 10
12	Rosecomb White Leghorns	...	...	163·33	0 14 6
108	Black Orpingtons	...	...	159·48	0 13 8
6	Imperials	...	...	158·16	0 14 9
12	Buff Wyandottes	...	...	155·25	0 14 8
18	Brown Leghorns	...	...	154·77	0 11 9
18	Golden Wyandottes	...	...	151·55	0 13 2
36	White Wyandottes	...	...	151·02	0 12 9
18	Buff Leghorns	...	...	147·77	0 12 9
108	Silver Wyandottes	...	...	145·30	0 12 3
60	Buff Orpingtons	...	...	142·95	0 12 4
6	Andalusians	...	...	142·00	0 10 10
6	Jubilee Orpingtons	...	...	141·33	0 12 2
6	Pile Leghorns	...	...	140·50	0 12 4
24	Minorcas	...	...	133·38	0 10 4
18	Langshans	...	...	131·88	0 10 0
6	White Rocks	...	...	124·00	0 11 0
12	Partridge Wyandottes	...	...	107·00	0 8 6

The following paragraphs are taken from Mr. D. Thompson's report:—

THE SYSTEM OF FEEDING.

The birds were fed at regular hours—viz., 7 a.m., mash; 10 a.m., green food (more or less, according to the condition of the grass in the pens); meat, *i.e.*, cut up boiled liver, at 3 p.m., twice a week; and grain at 4.30 p.m. The mash was composed of pollard and bran, about three-quarters pollard to one-quarter bran, more or less, according to the quality of the pollard, and mixed up with hot soup twice a week, and other days with hot water in the winter months, and cold water in the summer. The green food consisted of finely chaffed rape and lucerne, both splendid foods. The rape is the better alternative, while lucerne is the higher in food value, so that the merits of the two green foods lie in different results. This year the grain ration was composed of three parts wheat to one part maize, compared with three parts maize to one part wheat last year; and, while we have no wish to put the shortage of eggs compared with last year down to wheat-feeding, we have no hesitation in saying that if we had fed more largely on maize we would have had at least equal results, or even better. Shell grit and fresh clean water were always before the hens.

FINANCIAL.

The prices of foodstuffs were much lower than last year, and there was not so much fluctuation. The prices charged to us under contract.

right throughout the currency of the competition, were 8 $\frac{3}{4}$ d. per bushel for bran and 9 $\frac{1}{2}$ d. per bushel for pollard. Our average price for wheat was 3s. 4d., and for maize 2s. 6d. per bushel. The cost of feeding the 600 hens for the 12 months was as follows:—Wheat, £47 1s.; maize, £12 17s. 10d.; pollard and bran, £44 2s. 1d.; meat, £20; green food, £7 10s.; shell grit, £2 10s.; total, £134 0s. 11d.

The monthly range of prices for eggs was:—April, 1s. 9d. to 2s. 1d.; May, 1s. 11d.; June, 1s. 10d. to 1s. 5d.; July, 1s. 4d. to 11 $\frac{1}{2}$ d.; August, 11d. to 8d.; September, 8 $\frac{1}{2}$ d. to 7d.; October, 7d. to 7 $\frac{1}{2}$ d.; November, 8d. to 11d.; December, 10d. to 1s.; January, 1s. to 1s. 3d.; February, 1s. 3d. to 1s. 4d.; March, 1s. 6d. The market value of the eggs was £382 12s. 7d., from which deduct the cost of feed, £134 0s. 11d., and a profit of £248 11s. 8d. is left on the 600 hens. Every pen showed a profit on the cost of feeding, the pen returning the smallest value leaving a margin of 14s.

The eggs were marketed in ordinary patent egg-cases, holding 36 dozen, packed into cardboard fillers. The eggs were packed clean, without washing, the dirty ones being laid aside, also any that were too large for the square space, or any that were too small. This is a simple and satisfactory way of grading. The eggs when sent to market always commanded the highest rate, and often 1d. above it, so that it was no assumed price on which the value of the eggs produced was based.

[In comparing these figures with local results, the prices realised for the eggs must be taken into consideration. It will be noted that the lowest price received was 7d. per dozen, and the highest 2s. 1d. In South Australia prices would be fully 20 per cent. less than the above.—Ed.]

THE TURKEY.

By D. F. LAURIE.

The origin of the name "turkey" is not known, although several ingenious attempts have been made to account therefor. This bird is not a native of Turkey, but hails from North and Central America. The original birds were brought to Spain early in the sixteenth century, and from thence they reached England some years later. There are two main breeds of the turkey in America found in a wild state: the variety at one time very common in the North-Western States and Canada (*Meleagris americana*), and that found in Mexico, differing in many respects, and called by naturalists *M. mexicana*. The latter is considered to be the first bird imported to Europe, and in later times the more northern breed came over as the American bronze turkey. Here it may be pointed out that Australians have a habit of calling this variety Bronzewing. This is incorrect, and is due to associating the term with that applied to another bird, viz., the at one time plentiful and well-

known beautiful Bronzewing pigeon. Another less-known breed, found in Honduras and Central America, the ocellated turkey, is a magnificent bird, but rather delicate. That is, at least, the experience with importations made years ago in England. Very probably this bird would do well in parts of Australia, and prove of great value as an out-cross.

Experience seems to point to deterioration in size of the domesticated turkey as compared with its wild progenitor. Lewis Wright quotes 46 lb. as the greatest weight recorded in England, but this I believe is an error. There was a very large bird shown frequently some ten years ago, but I cannot lay hands on the records. Mr. T. A. Caterer had a well-known turkey cock which ran Mr. Wright's highest weight very close. This bird was often seen at Adelaide shows, and was a grand specimen. Three large birds I saw in Melbourne about 1896 weighed 37, 38, and 39 lb. respectively, and soon after a bird reached Victoria weighing rather more. Its weight when shipped was 45 lb. I heard of some huge birds in New South Wales, but as I did not see them or test their weights, I refrain from details. The wild turkey in America has been known to attain the weight of 60 lb.

Many years ago Sir James Boucaut had some very fine specimens, and from this stud Sir Samuel Way obtained the birds which he frequently exhibited in Adelaide ten to fifteen years ago. About twenty-five years ago the turkey formed the subject of a long discussion in the House of Assembly, when the late Sir R. D. Ross spoke at some length on the subject, mentioning particularly the American Bronze turkey, and the excellent weights attained. This particular lot of turkeys above referred to was distributed throughout the State, and I have at various times seen the descendants—some of them very fine birds—but losing many of the characteristics of the pure Bronze. It was a matter for congratulation when a few years ago Mr. T. Ainslie Caterer purchased a fine stud of birds from Mr. E. T. Sichlan, of Geelong, including the well-known Crystal Palace hen. Mr. Caterer distributed a number of birds, and finally disposed of the stud, but I am glad to say has arranged for a shipment from a leading American breeder of birds of the highest class.

Recently I addressed some remarks on turkey breeding to the members of the Southern Branches of the Agricultural Bureau, at Strathalbyn, and in urging the value of this branch of the poultry industry pointed out the suitability of the South for turkey raising. This, I think, was well recognised, because several were present who knew the cases I referred to. On a previous visit I was informed that a resident made more money from his turkeys than his sheep, and on a recent occasion a well-known legislator told me that for 75 of his young turkeys he was paid £1 per head by a Western Australia buyer. In various parts of the State turkey breeders are to be found who do well thereat. Only recently I heard of a Northern farmer who sold 300 odd to Broken Hill

at an average of a pound a head. These were all fine birds, and the prices were extra good, and cannot be taken as the usual thing, because there are times when buyers are not so keen, and when, perhaps, they are also more cautious in spending. If every one owning suitable turkey country utilised it to its fullest the very natural consequence would be a heavy supply, and the consequent glut of the local market, with ruinous prices. But there is the other outlet, the export trade, which could absorb, without affecting prices, all the turkeys we could breed if they were of suitable size, age, and in first-class condition. There is a heavy demand in England for prime turkey at certain seasons, and in these days of cold storage birds can be held for a time. Recent figures of England's imports in turkeys are not available, but as long ago as 1898-9 the following were the imports as given by Mr. Harrison Weir in his book:—

From Canada, 1898-9, 100,000 birds.

From America, 20,000, weighing 10 lb. each, average.

From Italy, 200,000, in a month.

From Russia, November till February, 50,000.

From Hungary, 200,000.

From France, 500,000.

The Canadians have during recent years built up an extensive and prosperous trade in poultry with England, and large numbers of frozen turkeys are sent yearly. Shipments from Australia have been made with fair success, but in most cases the birds have been too old, and in many cases neither large enough nor in good condition. We can learn from this that we must send only what will be well paid for. It must be well understood that while there is no opening for inferior goods there is always a market for the best, and at prices which will pay as well. Small birds are not in favour with English buyers, who first of all demand quality and condition, with right age, and then pay an increasing price per pound for larger and finer specimens.

That some alteration in the usual methods of turkey breeding as adopted in this State is necessary I have no doubt. In judging at various country shows during recent years I have handled numerous turkeys. Quite recently I "passed" several birds which appeared fair specimens, but which actually weighed little more than a fairly heavy fowl; but the worst feature common to nearly all the exhibits was the deformity of frame—breast crooked to a marvellous degree, and frequently the back also. These malformations are doubtless due to continued breeding from young stock, together with seasons of semi-starvation. Such birds are absolutely worthless, either as show birds or for breeding from. The turkey is slow to mature, and the earliest ages for the breeding pen should be: hens, two years; cocks, three years. It is well known in England and America that the introduction of wild or semi-wild blood has resulted in increased vigour in the strain. The whole trend

of modern poultry breeding is towards scientific mating, and, given fairly robust specimens for a start, the bogey of deterioration may be kept at bay by judicious mating.

Turkeys are not birds to be kept in a backyard: they may exist in such circumstances, but not as profit-producing stock. I see a good many cases where people fondly imagine they are making a good thing out of turkey breeding in confined areas, and I also note how often there are outbreaks of poultry diseases. Turkeys and other poultry seldom agree, and there is little doubt that turkeys under such conditions contract and spread roup and kindred diseases. It is well known that turkeys will not thrive on ground tainted by the droppings of other poultry. Even if such birds survive until they reach the chopping block, it can be understood that they are not of the quality an expert would call first class. Turkeys seldom thrive if roosting in enclosed houses: they are far better in the open air, on the lee of a hedge or clump of trees. In the suburbs such roosting places are tempting to the poultry thief. The swelled head disease so common in turkeys is the result, in most cases, of roosting in poultry houses. The naturally strong bird suffers a lowering of constitution, and the passing germ effects a lodgment ready to act at a favourable opportunity. The organisms causing roup and diphtheria may remain dormant for a long period, and people wonder how it is that the birds which have roosted for some time in the open are suddenly seized with sickness.

Scrubby country, with occasional clearings, is suitable for turkey rearing, though on very inferior land there may be but little natural food. In rough weather the birds seek the shelter of the bush, and feed in the open during calm, fine weather, or in open, sheltered nooks. Turkeys do very well in the North, even in parts where there is little shelter. If every farm had its large flock of turkeys we should hear very little of the ravages of insect pests. In common with other poultry they act admirably as land cleaners, eating all sorts of seeds, as well as gathering wheat, etc., from the stubbles. Unless there is abundance of such food available the birds must be well fed, and in any case additional food should be offered, but not wasted. There are, of course, many who say it "does not pay" to feed turkeys, etc. The "does not pay" generation will have to make way for the man who is practical enough to feed all stock at a profit.

The headquarters for the turkey farm should be not far from the homestead. A hedge or clump of trees may be selected. Where trees have not formed part of the farm scheme, a rough brushwork breakwind may be used, always remembering that in our climate such structures are a source of great danger from bush fires.

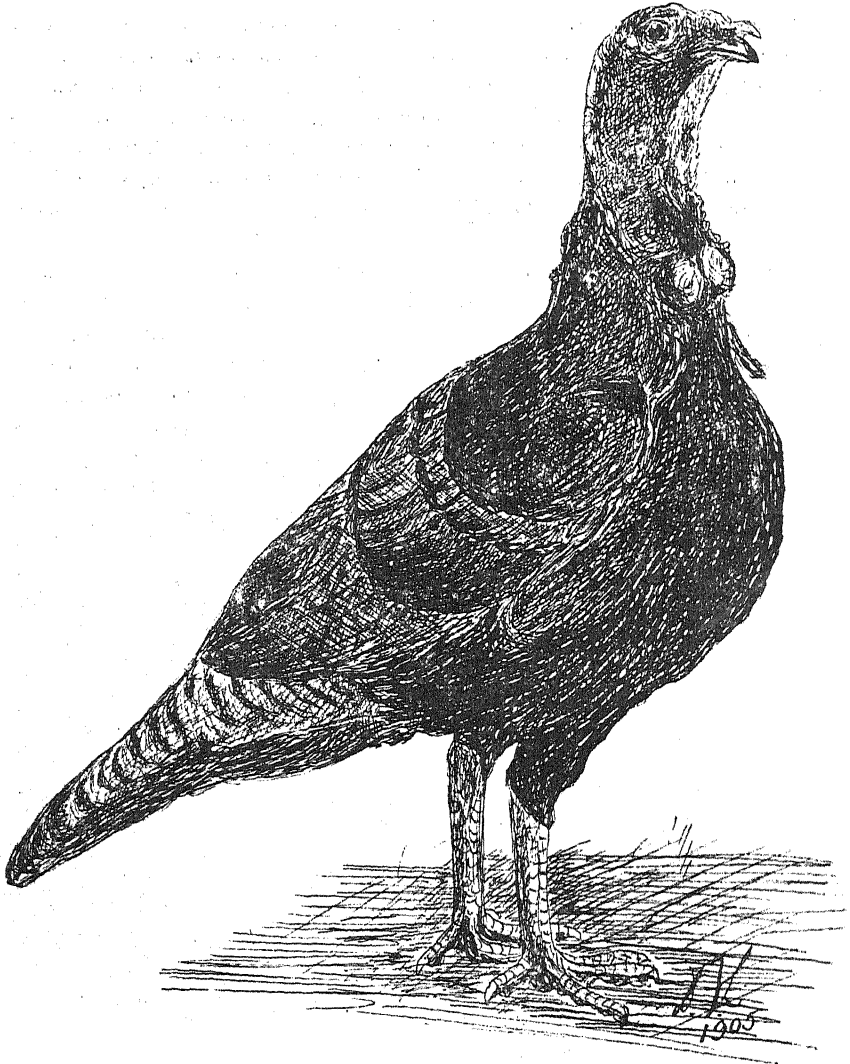
Having secured birds of the ages recommended, and of good quality, say, a gobbler of 25 to 30 lb. weight, and hens 15 to 18 lb., they should be got into good condition without delay, and induced to return each

night to their roosting quarters, where they are fed. A very common mistake is in starving the stud birds during the "off" season." Such a method lowers the vitality, and often causes permanent injury, which reproduces itself in the progeny, and also in lack of fertility in the eggs. Fair condition at all times is advised for stud birds. On the other hand, too generous feeding results in the cocks being too fat and heavy for breeding purposes, and in such cases they should be penned apart and fed somewhat sparingly. One visit of the hen to the gobbler results in the fertilisation of the whole batch of eggs to be laid. Not more than ten hens should run with an average robust bird. Valuable stud birds should be penned separately after the breeding season, when they are generally thin. They should be got into moderate condition as soon as possible.

The hens, if on free range, will make their nests in out-of-the-way corners, under bushes or hedges. They may be encouraged to select small houses or barrels, when the eggs may be better guarded against crows, magpies, and other thieves. Turkey hens, as a rule, dislike being disturbed when sitting, and the approach of strangers should be guarded against, as the disturbed hen often breaks eggs. Sometimes the hens stay too closely on their nests and starve. This is a matter requiring attention, as I have known hens to die from this cause, and besides, such close sitting militates against a successful hatching. Turkey eggs, which take from 29 to 31 days to incubate, may be hatched under turkey or common hens, or in incubators. When hatched artificially the chicks are easy to rear, but are very hard to teach to feed: they are remarkably silent, and seem stupid: they require but little artificial heat, but plenty of ventilation. The chicks have very small crops, and require feeding on the "little-and-often" plan. Raw egg, well beaten, with a little milk, and used to moisten rough oatmeal, stale breadcrumbs, etc., has generally given good results as a first food. Fine sharp grit and plenty of finely cut lettuce, garlic, and onion tops, etc., should be provided. Ordinary stinging nettles boiled and then mixed with the liquor and roughly ground wheat and barley meal are excellent, and promote growth and feathering. Cracked grain may be given as soon as the chicks will eat it. The early part of the turkey chick's existence is the critical period: they should be kept under shelter on wet days. Those intended for sale should be separated when about half-grown, and forced along; those intended for stock purposes should be well fed, but not forced.

The turkeys in this State are of various sorts. Some contain more or less American Bronze blood, and others either Norfolk or Cambridge blood, and very probably some may be descended in part from some of the Continental breeds. There are structural differences defining the various Continental breeds of turkey, and, while some think this due to ancestors of varieties now extinct, the real reason will probably be found in selection, aided by food, environment, and altered conditions generally.

All the varieties of turkey inter-breed, and may be crossed and re-crossed. A buff or fawn variety common in the South is often spoken of as the Madagascar turkey, which is, of course, a misnomer. This is one of the Cambridge turkeys. The Black Norfolk, which is here illustrated,



Black Norfolk Turkey Cock.

is a popular variety in England, a good doer, of great quality, a thick-set, sturdy bird, attaining great weight. The American Bronze turkey when in full plumage is a magnificent bird, and those who have seen a good specimen showing himself on a sunny day rank him with the peacock. An American admirer of the breed once regretted that this noble

bird was not adopted as the national bird of America instead of the eagle. There is one thing to be said on this question, and that is that the turkey, at any rate, is a marked factor in the production of American agricultural wealth.

There is no reason why South Australia should not stand in the front rank as a turkey-breeding State. We have the country suitable: the art is not difficult to acquire; we have a fair local market; and, with every provision for freezing, etc., at the Produce Depot, we can rest assured that if we send prime quality to England we shall reap rich rewards.

UNDER DRAINS.

By W. L. SUMMERS.

It is very doubtful whether the value of under drainage is fully appreciated in South Australia, especially by the orchardist. This applies particularly to orchards on hill slopes, which are generally regarded as well drained because any excess of water runs freely off the surface, too often carrying with it after heavy rain the best of the surface soil. Under drains are usually considered necessary to remove the surface water from the flats and from soakages on the hill slopes. I am, however, satisfied from my own experience, that in many of our fruitgrowing districts it will pay the growers to give more attention to this matter. Under drainage benefits the trees directly by extending the feeding area of the roots, and by removing excess of water which would have a more or less injurious effect on the roots. In addition, the removal of the excess water by under drains will be found to greatly facilitate cultural operations during the winter, where the land is at all inclined to be wet. All authorities tell us also that the passage of water through the soil has a beneficial effect in several ways. Most important of all is that it causes the air to penetrate the soil more freely and to a greater depth, thus affording greater opportunity to the nitrogen-gathering bacteria to abstract the ammonia from the air and to fix it in the soil for the use of plants. Further, the air has a weathering effect on the soil, thus assisting to reduce inert plant food to forms in which it can be taken up by the roots.

The number and size of the drains required will depend upon the rainfall of the locality, the position of the orchard, and the character of the soil. These factors, together with the financial position of the orchardist, and the materials available, must determine the class of materials to be used in the construction of the drains. Proper tile drains are unquestionably the best, but in this State are too costly for the average grower. Where durable timber is available very satisfactory drains can be constructed therefrom. In the vicinity of sawmills or sleeper-cut-

ting operations waste timber suitable for the purpose can usually be obtained at nominal rates. Failing timber, the stones which are turned up when the land is broken up can be utilised. A short description of and statement of actual labour involved in the making of a stone drain about 450 ft. in length may not be out of place.

My soil is mostly a strong black or brown loam, over a good clay: I would term it firm ground. The land is on a shale formation generally, with ironstone and quartz boulders in places. In breaking up our land we turn up considerable quantities of fairly large flat stones, besides numerous smaller rough pieces of shale, quartz, and ironstone conglomerate. The removal of these entails a considerable amount of labour, and, as our first winter's experience showed us the necessity for trying to drain two or three spots at considerable elevation, we decided to experiment with these stones in order to get two jobs done at one operation. Tiles and timber not being available we made the drains of stone. It is over twelve months since the first was completed, and as it worked satisfactorily two more have since been put down. The latest was about 450 ft. in length, and the whole work was completed at a cost equal to 12 days' labour of one man, viz., two men for four days, with two extra hands on two days. This represents an outlay of £3, or about 13s. 6d. per 100 feet of drain, including the removal of the stone. Allowing for the time occupied in gathering and carting this, the net cost of the drain comes to less than 11s. 6d. per 100 ft.

The drain is constructed in the following way:—The surface soil is removed to a depth of about 15 in. by a width of 2 ft. 3 in.; in the centre the soil is removed to a depth of 10 in. x 10 in. to 12 in. This is the actual drain, and it is filled with the larger rough stones so laid as to permit of a ready flow of water, without allowing it to rush away quickly enough to cause washing. Over these stones we lay the large flat shale, covering the breaks or joints with smaller pieces. The larger slabs rest upon the wall of soil on either side of the actual drain. Where we cannot get sufficient large stones, a layer of smaller pieces is put on to a depth of about 4 in., care being taken to lay them fairly even, and the surface soil is then replaced. To save labour, we plough the course of the drain to a depth of about 6 in., and throw out the soil. This operation is repeated until the desired depth is attained. If the soil is fairly moist, and a staunch, steady horse is available, the centre piece can be treated in the same way, removing the mouldboard from the plough. In making the drain just referred to we had to pick out the whole of the centre.

I am quite prepared to admit that a drain made in the way described would not be effective under all conditions. In light soils it would soon be choked unless special care was taken to put on a good covering of stone. In wet land it would need to be deeper and wider; but, as stone is usually only too plentiful, this would not be a serious drawback.

CIDERMAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 502).

PRESERVATIVES.

Every cidemaker is pestered with advertisements of anti-ferments that are guaranteed to cure all the evil results of carelessness and ignorance in cidermaking. No one, therefore, can wonder at these substances having a ready sale among cider-making farmers who do not understand the composition of these anti-ferments, and place implicit confidence in the claims of the respective vendors. The use of preservatives in articles of food has attracted much attention, and is likely in due course to become the subject of legislation. As I knew from the results of analyses that much cider contained preservatives, I decided to start a series of experiments on preservatives to determine the effect of each.

The first experiments were made on unfiltered juice.

Experiment 1.—To a 12-gallon barrel of juice a patent preservative—which we will call “A”—was added according to the directions supplied with the preservative. The gravity of the juice when the preservative was added was 1.0457, on 4th November, 1897. On 8th January, 1898, the cider was clear, of good flavour, and not very acid; but the gravity had decreased to 1.037, showing that fermentation was taking place. On 8th November, 1898, the cider was analysed, and had the following composition:—Sp. Gr., 1.0043; acid, .70; alcohol, 5.50. It will thus be seen that fermentation had continued as if no preservative had been added.

Experiment 2.—A further experiment was made on cider in cask, using another patent preservative, which we will call “B.” One bottleful of this substance was added in accordance with the printed directions to one hogshead of cider, which then contained 1.55 per cent. alcohol and 9.20 sugar, and had a Sp. Gr. of 1.0409. This juice was analysed again at the end of three weeks, and again at the end of another three weeks, and was found to be fermenting rapidly. On the 8th November, 1898, it was analysed, with the following results:—Sp. Gr., 1.0053; acid, .64; alcohol, 4.70; so that fermentation had gone on nearly to dryness, and the anti-ferment had proved a failure.

Experiment 3.—Mustard.—I had heard that in Devon the “sweets” were retained in the cider by the use of mustard, and so it was determined to give this substance a trial. The quantity generally used was stated to be one pound to the hogshead. Two pounds of the best mustard were therefore added to a two-hogshead barrel of cider having a Sp. Gr. of 1.0427. The juice was analysed three weeks afterwards, and found to be fermenting. Three weeks later fermentation had nearly stopped, but the acidity of the juice was rising. One year after, namely, on the 8th November, 1898, this juice was analysed. Little or no fermentation had

taken place during the ten months, but the acid had risen from .70 to .85, and the cider had a strong and most unpleasant taste of garlic: in fact, it was spoilt. This being the only experiment with mustard, the evil results obtained may be exceptional, while its power to check fermentation appears to be proved.

Experiment 4.—Formic Aldehyde.—This and the three following experiments were made with juice drawn from the barrel when racking but not filtered, and were carried out in bottles.

The effect of the formic aldehyde upon the cider was most remarkable. It produced an abundant precipitate, and caused the cider to become opaque and like very dirty milk. By degrees some of this substance begins to settle, but the settlement is never complete, so that after standing for one year the cider was not clear. In this experiment the quantities of formic aldehyde used were .05 per cent., .1 per cent., and .2 per cent. respectively. Three bottles were similarly treated in each experiment. This substance was found to stop fermentation, the cider having on 1st December, 1898, the same gravity as when put into bottles a year previously.

The sediment which is produced renders the cider absolutely unfit for anything, and it has been found impossible to take out this milkiness by any process.

Experiment 5.—Boracic Acid.—This substance was used in the same proportion as the preceding, only by weight instead of by volume: .05 per cent., .1 per cent., and .2 per cent. were each added to three bottles of cider. Neither of these quantities had any effect: the cider fermented to absolute dryness.

Experiment 6.—Sodium Salicylate.—0.1 per cent. of this substance was added to a bottle of cider, but the bottle was lost or burst, and no analysis was made.

Experiment 7.—Pasteurising.—Three bottles were pasteurised at 120°, three at 140°, and three at 160° Fahr. for fifteen minutes. Three out of the nine bottles broke from the effect of the heat. A temperature of 120° Fahr. had no effect upon subsequent fermentation, which proceeded until the cider was absolutely dry. A temperature of 140° Fahr. checked fermentation slightly, and that of 160° Fahr. still more so, but neither had completely checked the fermentation.

It was next considered desirable to conduct some experiments on filtered juice.

All the following experiments were carried out with the same juice, which had the following composition:—Sp. Gr., 1.0169; acid, .68; alcohol, 3.55; solids, 5.34.

Experiment 8.—Formic Aldehyde.—.01 per cent., .05 per cent., and .1 per cent. respectively. The formalin had the same action on the filtered cider as on the unfiltered, producing the white cloudiness or milkiness as before. No fermentation had taken place when these bottles were analysed in November, 1898, *i.e.*, eleven months after being filled.

Experiment 9.—Borax.—.1 per cent. and .05 per cent. respectively. Both these samples fermented slightly, but the colour and the flavour were found to have suffered by the use of this preservative.

Experiment 10.—Sodium Salicylate.—.05 per cent. and .01 per cent. Fermentation was checked, but not completely. The bottles contained some gas, though not enough. The substance had no injurious effect upon the flavour of the cider.

Experiment 11.—Pasteurisation.—This was carried out at 120° Fahr., and no subsequent fermentation took place, so that, at the end of eleven months, the liquid was "as dead as ditch-water."

Experiment 12.—Anticipating the result obtained in Experiment 11, the cider was pasteurised, and then a small quantity of pure yeast was added to it. Fermentation proceeded slowly, and a considerable amount of gas was produced; but the fermentation had not gone very far, for on 2nd November, 1898, the juice had the following composition:—Sp. Gr., 1.0153; acid, .51; alcohol, 3.75.

Experiment 13.—To determine what changes would take place in the bottled cider without the use of any preservatives or the application of heat, three bottles were filled at the same time as these experiments were started, and immediately fastened up as usual.

These, of course, fermented, and at the end of eleven months were found to be nicely up and to have a little more sediment than some of the bottles containing preservatives. But they were of excellent flavour.

Analysis proved that they had the following composition on 2nd November, 1898:—Sp. Gr., 1.0155; acid, .43; alcohol, 3.75.

It will thus be seen that fermentation had not proceeded very far, only, in fact, sufficient to produce a good sparkle in the cider.

The results of these experiments are evident. Not one of either the patent or the ordinary preservatives, when added to unfiltered cider, appears to have any effect in checking the progress of fermentation.

The same may be said of cider in bottle, provided that it be not first filtered. Formalin, which is the only exception, proved useless, owing to the peculiar precipitating action it has upon the colouring matter and other constituents of the cider. With filtered cider, provided that it be properly filtered, there appears to be no need for the use of preservatives, for if the amount of fermentation during an exceptionally hot summer like 1898 is so small as that shown by Experiment No. 13, it is evident there can be no object in adding preservatives to cider. In fact, the use of such preservatives is detrimental to the cider.

These experiments prove that farmers must trust to cleanliness of make, and to care in the manipulation of the juice, and not to preservatives, if they wish to produce the best cider. By so doing they will produce an article that will hold its own in the market, and will successfully compete with the cider now being imported, most of which contains preservatives.

FERMENTATION AND THE CHEMICAL CHANGES WHICH TAKE PLACE IN THE FERMENTING JUICE.

Fermentation in its truest sense is a chemical change. But all chemical changes are not due to fermentation. Contact, heat, and light will produce chemical change, but fermentation is produced only by living matter, "organised ferments," or by the exudations (secretions) of living matter now known as "enzymes," and formerly as unorganised ferments. Fermentation usually results in the splitting up of a complex substance into two or more less complex substances. At times a small quantity of a complex body may also be produced, but it invariably forms only a small proportion of the substances which result from the fermentation.

The saliva affords an illustration of the action of an enzyme. It contains an unorganised ferment known as ptyalin, which converts starch into sugar. This change may be proved by a very simple experiment. A very minute quantity of starch is placed in a test tube with about 12 c.c. of water and boiled. The liquid is cooled to 98° Fahr., and divided into two test tubes. Into one some saliva is allowed to flow from the mouth, and the tube is kept at 98° Fahr. for fifteen minutes, being frequently shaken. If a little iodine solution be then added to each test tube, the liquid containing the saliva will not change colour, but the starch solution in the other will become intensely blue. The absence of the blue colour in the solution containing saliva is evidence of the absence of starch. By appropriate tests it is easy to prove that the tube contains a solution of sugar, which the starch has been converted into by the saliva.

There is evidence to show that fermenting apple juice contains an enzyme capable of converting cane sugar into fermentable sugar. The average composition of the apple juice in 1894 was:—Sp. Gr., 1.0502; solid matter, 11.14; acid, .60; grape sugar, 7.59 per cent. It will be noticed that of the total solids only 7.59 per cent were present as fermentable sugar. On deducting this from the total solid matter in solution, and also the acid and mineral matter, there remained on an average 2.5 per cent. of substances not accounted for.

It was important to determine whether these substances would ferment, or whether the grape sugar shown by analysis to be present in the juice was the only substance that would ferment. Careful experiments proved that some of the other constituents were gradually changed, became fermentable, and finally converted into alcohol. The total amount of solid substances left unfermented in the juice appeared to be about 1.4 per cent. Evidence was then obtained to show that this matter was first converted into sugar. Thus, in barrel No. 16 the juice contained 10.32 per cent. of solids, and 7.11 per cent. of sugar, showing a difference of 3.21 per cent. One month after fermentation had commenced the solids were 6.96 per cent., the sugar 5.20 per cent., showing a difference of 1.76 per cent. only. The remainder evidently had been converted into sugar, for the sugar which had disappeared was not sufficient to account for the

amount of alcohol present. It was subsequently proved that apple juice contained, in addition to grape or fermentable sugar, a certain quantity of cane sugar. And this was separately estimated in all my apple analyses after 1896. This cane sugar, by the action of the yeasts or of the enzyme which they secrete, was first converted into grape sugar, and then fermented into alcohol and carbonic acid gas, etc. So far no evidence has been obtained to justify the conclusion that any other substance exists in the juice, either in suspension or in solution, which is rendered fermentable either by an enzyme or other agent.

As cane sugar has to undergo certain chemical changes before it will ferment, experiments were made to see whether the enzyme present in the apple juice would be able to so change cane sugar as to render it fermentable. For this purpose some of the best pure cane sugar was obtained and about 4 per cent. added direct to the juice. Care was taken in making this experiment to have only pure cane sugar, for beet sugar, of which there is a good deal on the market, is said to be far from beneficial to fermentation. It was known that by heating cane sugar with acid it was so changed that it became fermentable: accordingly in some simultaneous experiments the sugar was dissolved and heated in a little cider before being added to the bulk. The results of these experiments showed, however, that cane sugar was slowly converted into a fermentable state without the previous treatment of heating with cider, though the change is not so rapid as when the sugar is heated with cider. Hence cane sugar may be added to apple juice when it is desired to improve it, immediately it comes from the keeve, or after the first fermentation has set in; and it may be added either as a powder, or in solution in apple juice.

So far as we know at present the only enzyme which plays any part in cidermaking is the one which converts cane sugar into fermentable sugars. The organised ferments which are important in cidermaking may be divided into three classes. The moulds, the yeasts, and the bacteria. Moulds are familiar in their general appearance to every one. Few substances form a better medium on which they will grow than damp bread or bruised apples. Make a pulp of bread with a little water and spread it over the surface of a soup plate about half an inch thick. Let it remain exposed to the air for half an hour, then cover it with another plate or with a piece of glass and put aside. In due course spots of mould will begin to grow: as they increase with age they will take various colours: blue, green, yellow, red, brown, black, or white. These colours are generally due to the seeds or spores of the mould which, under a strong magnifier, may be seen growing in clusters of varied shape at the end of fine upright stems which have arisen from the mould (mycelium) on the surface of the bread. If these spores are shaken off and examined under the microscope they are seen to be minute spheres, and experiments prove that they are capable of growing in apple juice and of causing therein undesirable changes due to the special kind of fermentation which they set up.

The yeasts are round or oval bodies, generally the latter shape, which grow mainly in solutions containing sugar. At times they take a sausage shape. They are comparatively large, as may be seen by examining a little German yeast, mixed with water, under the microscope, using a one-sixth-inch objective. If the water contains some sugar, and the solution is kept warm, 70° Fahr., the yeast will grow, and upon examination the large cells will then be seen to have little buds or small cells forming at one or maybe both ends. These gradually increase in size until they are as large as the mother cell, to which sometimes they remain attached, though many break off at a quite early stage of growth and carry on an independent existence. Owing to their propagation by buds the yeasts are termed sprouting fungi.

The bacteria are far more minute than the yeasts, and will require for their study a one-twelfth-inch objective, though many can be seen even under a one-sixth-inch objective. If a little of the "tartar" which accumulates around the teeth be mixed with water, and examined under a microscope, using very little light to begin with, the material will be found to be swarming with bacteria. In fact, all the typical forms of bacteria can very frequently be found in this material. Perfectly spherical globes or "cocci"; very short or medium-size rods, "bacilli"; curved rods and spirals, "spirillæ." Unlike the yeasts, no buds can be found on the bacteria. They multiply by splitting in two. Hence they are termed fission fungi. Here it may be stated that all these three varieties of organisms—moulds, yeasts, and bacteria—are looked upon as plants or vegetable growths, and included under the head of fungi by botanists. Enzymes, yeasts, moulds, and bacteria all play a part for good or ill in the manufacture of cider.

As, however, the principal and desirable changes are brought about mainly by yeasts, we may first study their action. They convert the fruit sugar into alcohol and carbonic acid gas. It was originally supposed that 100 parts of fruit sugar would yield 51.1 parts of alcohol and 48.9 parts of carbonic acid gas. But the yeasts feed on the sugar, and it is by taking away from it the small quantity of food which they consume that they leave the remainder in the form of alcohol and carbonic acid gas. Pasteur has shown that only 48.3 per cent. of alcohol and 46.4 of carbonic acid are produced, small quantities of other constituents, *e.g.*, glycerine, being also formed. This is the fermentation which the cider-maker desires. But it is not produced by every variety of yeast. In fact, there are many varieties of yeast, and some are known to have a very detrimental action on the fermentation. These are generally termed wild yeasts. The yeasts grow rapidly when they are present in a liquid exposed to the air or well aerated. But under these conditions they burn up the sugar rather than ferment it. This is one reason for the frequent mention in this report of the necessity of preventing the air getting to the fermenting juice.

Some varieties of yeasts grow on the top of the liquid which they ferment; others grow at the bottom. For cidermaking a bottom fermentation is most usual and most desirable, though cider is sometimes made by top fermentation, as in brewing. Probably one of the chief advantages of keeving, and skimming in the keeve, is that it removes any top fermentation yeast which may be present. As already stated, fermentation is most rapid in well-aerated juice. The rate at which fermentation proceeds also depends upon the number of cells present in the liquid. Therefore, when a slow fermentation is wanted, the maker continually racks his cider. By each racking he diminishes the number of yeast cells present in the juice, provided he takes care not to disturb the sediment in the cask, which consists largely of these cells. The same result can be obtained more rapidly and more effectively by filtration.

The rate of fermentation also depends upon the temperature. The higher the temperature the more rapid the fermentation, and *vice versa*. Hence the necessity of being able to control the temperature of the keeving room, and, where possible, of the storing room.

The more closely the changes produced by fermentation correspond to the theoretical conversion of sugar into 48.3 per cent. alcohol, etc., the better the cider. This conclusion has been come to only after several years of close observation. The improvement in the cider produced at Butleigh is probably due more to the bringing about of this purer fermentation than to any other cause. It will be well to retrace the steps which have enabled me to formulate the above statement. In 1893 the average amount of alcohol produced in 14 barrels made before the end of November was 63 parts for every 100 parts of solids lost. As then reported: "It is evident that this is not a pure alcoholic fermentation."

In 1894 the following results were obtained:—

Table Showing the Average Composition of Fermenting Juice at Different Periods.

	No. of Samples.	Sp. Gr.	Alcohol.	Acid.	Sugar.	Solids.
Juice when vatted	13	1.0497	—	.58	7.65	10.98
After 1st week	13	1.0486	.43	.65	7.48	10.90
" 2nd "	13	1.0399	1.30	.71	6.88	8.84
" 3rd "	13	1.0301	2.31	.73	5.21	7.58
" 4th "	13	1.0234	3.14	.72	3.82	6.07
" 5th "	12	1.0200	3.53	.71	3.27	5.43
" 6th "	11	1.0178	3.78	.71	2.95	4.81
" 7th "	9	1.0174	3.78	.73	2.88	4.57
" 8th "	8	1.0161	3.88	.76	2.76	4.41
" 9th "	6	1.0146	4.06	.77	2.45	4.11
" 10th "	4	1.0140	4.16	.83	2.30	4.08
" 11th "	4	1.0121	4.48	.82	1.72	3.56
" 12th "	3	1.0102	4.66	.86	1.30	3.16

Taking the average of those barrels, 4.81 parts of alcohol by weight have been produced from 8.27 parts of solids, so that the sugar has produced 58 per cent. of alcohol.

In 1895 the results obtained were as follows:—

Average Composition of Fermenting Juice at Different Periods.

After Commencement of Fermentation.	No. of Samples.	Sp. Gr.	Alcohol.	Acid.	Sugar.	Total Solids.
From press	13	1.0525	—	.46	11.47	12.76
1 week	2	1.0447	1.40	.62	9.63	11.02
2 weeks	7	1.0360	1.86	.60	7.66	8.96
3 "	5	1.0308	2.54	.62	6.30	8.00
4 "	7	1.0264	2.93	.67	5.39	7.03
5 "	5	1.0227	3.41	.69	4.65	6.25
6 "	7	1.0204	3.54	.71	4.01	5.72
7 "	5	1.0169	3.95	.68	3.39	4.94

These results are far more satisfactory than those obtained in 1893 or 1894. It will be found that the amount of alcohol produced is about 50 per cent. if calculated on the total solid matter, and only 48 per cent. if calculated on the sugar. This is almost a theoretically correct result.

In 1896 experiments were made with pure yeasts, and the following results were obtained:—

Table Showing Progress of Fermentation.

	Sp. Gr.	Total Solids.	Acid.	Alcohol.	Sugar.	Tannin.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Juice	1.0581	14.30	.40	—	12.71	.178
1 week after	1.0537	12.98	.54	.81	10.96	.194
2 weeks "	1.0400	10.31	.54	2.05	8.39	.205
3 " "	1.0343	9.06	.58	2.56	7.19	.226
4 " "	1.0287	7.96	.61	3.18	5.97	.229
5 " "	1.0243	6.99	.62	3.63	5.20	.209
6 " "	1.0203	6.14	.64	4.06	4.27	.218
7 " "	1.0177	5.67	.66	4.35	3.68	.227

The above table is the average of six barrels which were all inoculated with pure yeast cultures, and so may be considered to have fermented under the most regular conditions. By deducting the sugar present at the end of the seventh week from that present in the original juice, we find that 9.03 per cent. has been converted into alcohol, of which it has produced 4.35 per cent. Theoretically, according to Pasteur, the amount of alcohol should have been 4.38 per cent. in an absolutely pure fermentation. These results, then, are remarkably close to the theoretical yield.

Thus each year, as greater care was taken in the manufacture of the cider, the amount of alcohol actually produced approached nearer and nearer to the quantity that theoretically should be produced. The above

facts led me, in 1895, to the assumption that "a purer fermentation has taken place each year"; and the above results, obtained with pure cultures of yeast, prove, I think, the correctness of that assumption. They also show that, by estimating the amount of alcohol produced from a given quantity of sugar, we have a simple means of determining whether a proper or improper fermentation has taken place in the apple juice. The practical advantage of this should be enormous to cidermakers. For, while as yet it is most difficult to determine by microscopical examination the purity of the ferments present in the juice, it is not difficult for any well-trained, careful chemist to accurately estimate the amounts of sugar and alcohol present at various stages of the manufacture.

Such are the changes produced by the first or alcoholic fermentation.

SECONDARY FERMENTATION.

The term secondary fermentation has, I find, two distinct meanings. Many people use it simply to express any change which has been detrimental to the cider, and they are not wrong in saying that such change is due to a secondary fermentation; but then it is a detrimental fermentation, and so will be treated by me as a "taint" or disease. I apply the term "secondary fermentation" to those normal changes which take place in good cider after the primary fermentation or production of alcohol has taken place. What the changes are which take place in the juice during the period of ripening, spoken of as the second fermentation, I cannot at present state; but one result is evident, and explains why it is that cider—and probably every other fermented liquid—mellows and becomes soft with age. This slow fermentation of ripening causes a diminution of acidity.

That such a change takes place invariably with good cider is well shown by the following results:—Some cider containing 0.65 per cent. of acid was bottled for experimental purposes, and some months afterwards was again analysed. It then contained only 0.48 per cent. of acid (malic). In another instance the juice contained, when bottled on the 24th January, 1896, 0.62 per cent. of acid; on 7th May, 1896, 0.53 per cent.; and on 2nd November, 1896, 0.45 per cent. of acid. The proof of this change being due to fermentation has been strongly demonstrated by the experiments on preservatives. For instance, the cider used in experiments 8 to 13 when bottled contained .68 per cent. acid. At the end of eleven months the cider containing formalin, in which fermentation had been stopped, showed .65 per cent. acid. Those containing sodium salicylate, in which fermentation was checked, showed .63 per cent. and .60 per cent. respectively. In the cider containing borax the acidity had been reduced to .58 per cent.; in that which was pasteurised and to which yeast had been added the acidity was .51 per cent.; but in the samples kept as a check, and in which most fermentation had taken place, the acidity was reduced to .43 per cent.

This reduction of the acid materially softens the cider, and it probably does more than this. What becomes of the acid? My impression is that, in some way or other, though how is not yet certain, it goes to produce those flavouring substances which are present in well-matured cider, and which are certainly not present in the juice when it is bottled.*

There is further evidence to prove that this diminution of acidity is essential to a good cider, for whenever a sample of cider is of inferior quality, no matter from what cause, the acid in it instead of having diminished has invariably increased.

PURE OR SELECTED YEASTS.

It has been stated that the fermentation which takes place in apple juice, and converts it into cider, is brought about by minute vegetable cells termed yeast. These cells grow on the outside of the fruit and are not confined to apples, being found on grapes, etc. There are many varieties of yeast; and each yeast, in addition to producing alcohol, appears to have the power of affecting both the flavour and aroma of the liquid in which it grows. As certain apples have the reputation of making superior cider to that made from others, I was anxious to discover, if possible, whether they had special yeasts growing upon their skins, or if this result was due to the chemical composition of the apple. A few experiments were made in 1894, to isolate the yeasts present on certain apples, and pure cultures were obtained with which some filtered apple juice was inoculated.

Some apple juice was also inoculated with yeasts obtained from other sources. In all, six varieties of yeast were used, the original sources being as under:—

- No. 1, from black grapes (hothouse);
- No. 2, from white grapes (hothouse);
- No. 3, from pure cider yeast culture (foreign);
- No. 4, from Kingston-Black apples;
- No. 5, from Gin apples;
- No. 6, from pure cider yeast culture (foreign);

and the resulting ciders, although all were originally the same juice, were totally distinct both in flavour and aroma, showing that to a large extent these qualities depend upon the particular kind of yeast which produces the fermentation.

To obtain a large, pure culture of a particular yeast is no easy task. The yeasts are first washed or scraped off the skin of the apple or grape into a solution of sugar, etc., known as Pasteur's liquid. With a drop of this liquid some apple juice gelatine was inoculated and poured out into a Petri dish.† Every yeast cell present now grows and produces a colony,

* Many flavouring substances consist of compounds of acids and alcohols, and it is probable that this accounts for the diminution of the acid with the increase of flavour.

† Since these experiments were made the more modern system of Hansen, starting with an individual cell cultivated in a moist chamber, has been adopted.

which if of perfect contour may be said to represent a single yeast cell. This was gradually cultivated in proper nutriment until there was a sufficient quantity to ferment a hogshead or two of apple juice. The great difficulty was to keep every solution in which the yeast was cultivated pure and free from contamination. For the first culture a minute portion of the pure yeast is transferred to a test tube containing sterile apple juice gelatine.

This growth, if upon examination it is found to be free from any contamination, is called a "pure culture."

Having obtained these pure yeasts, it was next necessary to cultivate them in bulk. They were first grown in 10 cubic centimetres of cider. From the 10 cubic centimetres of cider they were transferred to 100 cubic centimetres in a Pasteur's flask. After full growth had taken place they were each transferred into cone-shaped, flat-bottomed glass flasks containing 300 cubic centimetres of Pasteur solution. This solution contains cane sugar and all the mineral and other constituents necessary to the growth of yeast. It had to be employed as this work was proceeding during the summer, when apple juice could not be easily obtained in sufficient quantity. However, the Pasteur solution answered the purpose.

The yeast was now growing vigorously, and increasing materially in bulk. So soon as fermentation stopped, it was transferred to a large flask containing 1,500 cubic centimetres of Pasteur solution, and subsequently to metal vessels containing 3,000 cubic centimetres of solution. This was done prior to the commencement of cidermaking. At Butleigh the yeasts were transferred to six small barrels, each containing eight gallons of sterile apple juice. The apple juice was first sterilised by passing superheated steam into it for twenty minutes. Finally, the yeast was placed in large barrels, which were filled with apple juice. The cider made with these pure cultures confirmed the results obtained in previous years, namely, that the yeasts give a distinct flavour to the cider, according to the variety employed. With the yeasts obtained from the grapes the resulting liquid has been more like wine than cider, having a slight but distinct wine flavour.

In 1899 I was anxious to determine how far selected yeasts obtained from fruit abroad would affect the cider produced from the juice of English apples. I therefore wrote to Mons. G. Jacquemin, the celebrated French chemist, who has made a special study of yeasts, and asked him to send me four varieties of yeast which had been proved to yield good cider in France. He replied that he had sent my letter to the Institut la Claire, of which he is scientific adviser, and asked them to forward me certain varieties. The Institut la Claire is the best-known institute (one cannot term it a factory) engaged in the production of cultures of pure yeasts for the manufacture of wine and other fermented liquors. The institute is situated at Le Locle, in Switzerland, at an elevation of over 3,000 feet. One of the most essential features of the preparation of pure cultures on a large scale is to ensure the purity of the atmosphere.

Hence the desirability, if not necessity, of having a station at as great an altitude as possible. I, who have had to work mainly in London in preparing pure cultures of yeast know to my loss and disappointment how immensely difficult it is to keep the cultures pure in such a contaminated atmosphere. M. James Burmanne, the Director of the Institut, sent me four different cultures representing the pure yeast found in the cider of the following districts:—1, Auge; 2, Orne; 3, Calvados; 4, Bondy. At the same time he wrote as follows:—"Each flask of concentrated cider yeast represents one kilogramme (about 2 lb.) of our active pure yeast. You must proceed as follows, for each flask:—Take a litre of water and dissolve in it 100 grammes of sugar, 5 grammes of tartaric acid, and 5 grammes of ammonium phosphate. Boil for a quarter of an hour, and then cool to 30 C. (86 F.). The yeast in one of the flasks is then added to this liquid, and the whole allowed to ferment in a large flask at a temperature of from 68 F. to 78 F. At the expiration of five or six days, when the fermentation is active, the contents may be considered to represent one kilo of active yeast."

The yeasts having been prepared in this way were next transferred to pasteurised cider, and when this was in active fermentation it was placed in a keeve. Preparations had been made to fill five keeves with juice of the same composition. Four of the keeves contained the four selected yeasts, the fifth keeve being used as a check to determine what kind of cider would be produced by the juice without a selected yeast. The juice from each keeve was kept separate, and, when it was filtered, a number of bottles were filled with the cider, as also a barrel. After standing for one year, so as to enable the flavour and aroma that might be produced by each yeast to be developed, these ciders were very carefully examined. The results were as follows:—The natural juice which contained no "selected" yeast had certainly produced the most typical cider. The four selected yeasts produced liquids which were not what we should call cider. They would, in fact, be better described by the German term Apfelwein (apple wine). They possessed the flavour of a light Rhine wine without the alcoholic strength.

It would thus appear that the selected cider yeasts which have given very satisfactory results abroad do not succeed so well when used to ferment the juice of our English apples. These results were somewhat similar to those previously obtained with selected yeasts of my own cultivation. Those obtained from grapes had produced a liquid having none of the characteristic flavour and aroma of good cider. On the other hand, very excellent cider was obtained when the yeast selected had been taken from a variety of apple generally accredited as producing good cider. A pure culture of yeast selected from the Kingston-Black apple when used to ferment the juice of other apples had produced a cider having to a certain extent the flavour and aroma of cider produced from Kingston-Black apples. This very remarkable result needs to be confirmed, and opens up a wide field of enquiry.

We are forced to the conclusion that if we desire to produce the best cider we must first seek for the best varieties of yeasts to be found on the apples which we have to deal with. It is not unlikely that the composition of the juice of the apples may so greatly affect the influence and power of a selected yeast that one which would give the best results with the juice of the apples of Somerset might not give equally good results either with Herefordshire apples or Devon apples. Thus the further study of the problems of cidermaking must open up a field of investigation far wider than has been anticipated in the past. The cultivation of these pure yeasts upon a sufficient scale to enable experiments to be carried out in several counties would not necessitate a much greater outlay than would be required for the cultivation of the yeasts for one county only. But the expense must be greater even for the county of Somerset than these experiments have hitherto entailed, and until this expense can be met I fail to see how any further development of this work with pure selected yeasts is likely to benefit the cidermakers of the country generally. Undoubtedly a far better cider can be produced by the employment of a selected yeast than by the uncontrolled miscellaneous fermentation which is now mainly relied upon to produce cider.

In a juice fermented with a pure yeast, fermentation proceeds more slowly, the juice keeps much clearer, and, if desired, the sweets (sugar) may be retained longer than is possible when the juice is allowed to ferment naturally. But to succeed with a pure yeast it is essential to employ sufficient to adequately inoculate the juice at the commencement, otherwise from a want of sufficient pure yeast the juice will ferment far too slowly.

(To be continued.)

ENGLISH MARKET GARDENERS IN PARIS.

A visit which a party of some thirty market gardeners and dealers from the Evesham district of Worcestershire has just paid to the environs of Paris is a noteworthy event in the history of British horticulture. It has been generally assumed that there was no chance for British producers to compete with those of France in the supply of early lettuces, carrots, radishes, etc., for English markets; and the tendency in England has been for growers to content themselves with making reflections against the railways in respect to the large quantities of foreign produce carried by them—mainly at a time when no English-grown supplies of that kind are available. As it had been represented to certain influential traders at Evesham that the Paris growers who send over their 4,000 or 5,000 crates of early lettuces and their 500 crates of early carrots to England every day throughout the season had no real advantages which could not be equally enjoyed at Evesham, the visit was arranged with a view to an enquiry into the particular conditions under which the French industry is carried on.

The facts ascertained were not only interesting, but most encouraging. An inspection of a number of market gardens just outside the fortifications on the south-east of Paris (where such gardens extend for a total distance of eight miles) has shown that the success of the French growers is due less to any climatic advantage than to a very practical system of cultivation under glass on what are, in effect, forcing beds, to which, however, no artificial heat is applied. At first sight a Paris market garden presents the appearance of from one and a half to two or more acres of land almost covered by ranges of glass frames standing about 1 ft. above the soil, while over each is a straw mat which can readily be rolled up during the day, when the temperature allows. These frames are supplemented by hundreds of bell-shaped glasses, known as *cloches*. Under these the lettuces are grown, various transplantings taking place, according to growth. Frames and *cloches* alike stand on beds made up of rotten horse manure, with a certain proportion of fresh manure, especially as a foundation, fresh manure being at the same time piled up alongside the frames and around the *cloches* to protect them from frost. Some of the gardens seem to consist almost entirely of this rotten manure. In the case of lettuces there are three successive sowings, beginning in August, the lettuces being ready for the market in six weeks. The supplies continue until April. The varieties grown are the "cabbage" and "cos," one of the latter and three or four of the former being planted under each *cloche*, with larger quantities in the frames. The early carrots and turnips are grown under like conditions, and there is every reason to believe that the business is a most lucrative one.

The opinion formed by the visitors was that, while not every part of England would allow of the growing of early vegetables according to the French method, yet there were no climatic conditions which would prevent the adoption of that method in the favoured district of Evesham, and especially on the warm banks on Longden Hill and those facing the south. Evesham, with its warm, moist climate and encircling hills, was, in fact, regarded as still better adapted to such an enterprise than the exposed environs of Paris; and some of the growers asserted that the cabbages which they had growing in the open were much more advanced than those they saw in the open around Paris. The only difficulty lay in the procurement of enough manure, at a sufficiently low price, at Evesham. Assuming, however, that this difficulty could be surmounted, the general conclusion was that early salad lettuce for the English markets could very well be grown with equal success and economy in the Vale of Evesham. It was admitted that Evesham could not produce all the supplies likely to be required, and that, whereas the French lettuces came to London, any that were provided by Evesham would be more likely to go direct to the markets of the Midlands, the North, and South Wales. There should, however, be room for both French and British supplies; and it is hoped that salads in January, February, and March may become an item

of popular diet in England, instead of being, as at present, mainly a luxury for the well-to-do.

Experiments will at once be started at Evesham on the French lines. It is probable that further visits to the Continent by Evesham growers, to enquire into the methods of foreign competitors in other branches of horticulture, will follow.—*London Times*.

MYLOR TYPICAL ORCHARD.

Last year a committee, consisting of Colonel Rowell and Messrs. G. R. Laffer and T. B. Robson, was appointed to co-operate with Dr. Holtze (Director of the Mylor Typical Orchard) in determining the commercial value of the fruits grown in the orchard. Owing to unavoidable circumstances it was impossible to call the committee together as early as could be desired, but two meetings were held during March and April. The following report has been submitted to the Hon. Minister of Agriculture by the committee:—

“We have the honour to report as follows:—On March 16, in company with yourself, Professor Angus, and Dr. Holtze, we visited the typical orchard at Mylor. We regret the season was so far advanced that we were unable to see any of the trees carrying fruit, which, as explained by Mr. Holtze, was owing to the ravages of birds—all fruits had had to be gathered promptly in order to save specimens for testing keeping and other qualities. We wish to express our appreciation of the very able manner in which Mr. Holtze has carried out his duties as Curator, and also to note the very satisfactory growth of the trees during the past dry season. We have much pleasure in welcoming Mr. George Quinn, who has been appointed a member of the committee, and feel certain he will be able to render valuable assistance. On March 22 the committee visited the Economic Museum at the Botanic Gardens, and went carefully through the collection of fruit from Mylor. We have taken notes of twenty-eight varieties of apples, some of which show great promise as early shipping sorts. Almost all of these are new to South Australia. The collection contains many promising later keepers, which will be noted as the season advances. There are also a fair number of very promising pears, maturing at different seasons, most of which are new to South Australia. Notes have been taken of these. On April 12 the committee again visited the collection of fruit at the Economic Museum and further examined the different varieties. Some of those previously noted still showed promise. Records of these have been kept.”

MOTTLES IN BUTTER.

By P. H. SUTER, Dairy Instructor.

In the February issue I dealt with the causes of streakiness in butter, and the methods to be adopted to guard against that objectionable defect. I now wish to refer to mottles, a trouble due to totally different causes, though this fact is not recognised by most buttermakers, mottles and streakiness being generally referred to under one description.

As previously pointed out, streakiness is due largely to uneven working of the salt throughout the bulk of butter, and it should be stated that there is a stage in the salting of butter where, if working ceases, the butter will eventually present a somewhat mottled appearance. Generally speaking, however, mottles are in patches rather than streaks.

Mottles in butter are not very often met with, but there is no doubt that they greatly deteriorate the value of the product. Mottles are mainly due to the non-straining of cream that has come to the factory over rough roads, and arrives in a partly churned condition. The result of failure to strain the cream is that the small granules of butter find their way into the churn, and, being firmer than the rest of the cream, do not take the colouring matter evenly, the consequence being that light patches or mottles appear throughout the finished article. No matter how much the butter may be worked, it will always show mottles. In a similar way, mottles may be due to two other causes. As every factory manager knows, very often coagulated or curdled milk is found at the bottom of the cans of cream. If this is not properly strained out it goes into the churn, and, as it will not take up the colouring matter, specks of curd or caseine will appear throughout the butter. Firm or hardened cream from the edges or top of the cream can or maturing vat will also refuse to take the colour. The churning together of creams of different ages, especially new cream and that well advanced in acidity, tends to produce mottles. In addition to this defect, the practice of churning together creams in different stages of development of acidity results in loss of butter fat. Again, special organisms may cause uneven colour in the butter which would be described as mottles.

Where mottles are caused by irregularities in cream it will be found that the trouble can be avoided by thoroughly mixing or stirring the cream at the farm, and again at the factory. On the farm this should be done each time cream is added to the can, taking care that the fresh, warm cream is not run direct into the older cream; they should be mixed when about the same temperature. Where the cream is delivered "sweet" at the factory it should be carefully strained, and during the ripening process it should be stirred thoroughly to secure an even degree of acidity throughout the mass. The butter must be worked thoroughly and completely.

If these precautions are taken mottles will seldom, if ever, occur, and the butter will command a better price and will keep longer.

There is another point in connection with this subject which might be mentioned, *i.e.*, the separating of the cream. If separated too thin it will churn readily during transit from farm to factory. Thin cream does not keep so well; besides, it adds to the bulk to be conveyed to the factory. The cream should show 40 lb. to 45 lb. of butter fat to 100 lb. of cream.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, April 12, there being present—Colonel Rowell (chair), Messrs. A. Molineux, G. R. Laffer, R. Marshall, and G. F. Cleland.

Regret was expressed at news of serious accident experienced by Mr. John Miller.

The Secretary for Agriculture intimated that steps were being taken to secure samples of the best South Australian honey. These would be sent to the Agent-General in London with a view to obtaining the opinion of the trade thereon.

The Secretary for Agriculture advised that the committee in connection with the Mylor Typical Orchard had inspected the fruit from the orchard, and a report would be available in due course.

In reply to question, the Secretary stated that the Department possessed a small supply of "cultures" of nitrogen bacteria, and arrangements were being made for experiments during the present season.

Approval was given to the formation of Branches of the Bureau at Yacka and Freeling if suitable gentlemen were nominated as members.

Mr. Molineux reported on proceedings of Naracoorte Conference.

The following gentlemen were approved as members of the under-mentioned Branches:—Petina—Messrs. A. Dunn, W. Boyton, B. Priest, and G. Newbon. Denial Bay—Mr. E. A. Hastings. Calca—Messrs. W. Leopold and T. Lewis. Whyte-Yarcowie—Messrs. M. Walsh, G. D. Mudge, and A. J. Rasmus. Crystal Brook—Messrs. H. Sutcliffe, A. E. S. Clarke, J. Gale, E. Robinson, — Palmer, and J. Forgan. Balaklava—Messrs. R. Heard, G. M. Shepherd, James Kelly, E. Cecil, R. Shepherd, and G. Hams. Onetree Hill—Messrs. W. J. Bowman, and M. C. Kelly. Morgan—Messrs. W. Dohnt and J. Hoepner. Port Pirie—Messrs. L. Stanley and H. Hawkins. Port Elliot—Mr. H. H. Hurrell. Gawler River—Mr. James Hayman. Appila-Yarrowie—Messrs. C. R. Grant, G. Reichstein, H. Mayor, and A. Grant.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report May 1, 1905:—

The drought, which was assuming a serious aspect when issuing our former, continued right into the second week in April, when rain set in, and, although in parts the downfall was fairly heavy, it was not sufficiently general. However, about the 23rd of the month, what may be described as a splendid agriculturists' rain was recorded, covering pretty well all the farming areas, and by far and away the wettest April for years was experienced, even on the eastern slopes right up to the River Murray. Another pleasing feature is, the moist conditions have been followed by genial weather, which has already given the grass such a start that farmers are now practically assured of winter feed for their stock.

COMMERCE.—At no time during April did the magnitude of business approximate anything equal to its immediate predecessors. This, no doubt, was directly attributable to country buying orders being then considerably restricted; but as the whole aspect now has so improved, merchants are looking forward to a healthy trade prevailing from this out. The silver mines at Broken Hill continue to give a substantial output, and, although there has been no boom in the scrip, present prices are higher than for a long time. In metals, Silver, Lead, and Copper have well sustained previous quotations.

BREADSTUFFS.—U.K. rates have further declined, and 31/- to 31/3 is now quoted as full value for South Australian cargoes, c.i.f. The sales of wheat during April were exceedingly small in South Australia and New South Wales, but in Victoria more business was done. In consequence of favourable weather, farmers in this State are now busy ploughing and sowing, and little or no Wheat is finding its way to market, the transactions being limited to stored parcels. Not much business has been done in Flour for local consumption, and prices offered by England and South Africa are so low that millers are induced to hold their stocks, hoping for better rates. In Fodder, fair trade in Chaff was put through with New South Wales, and continued well into the month, until deliveries of Hay were restricted, owing to our farmers being busy seeding; but, locally, chaff merchants had rather a dull month. Considerable sales have been made in Bran and Pollard, and those who had purchased ahead appear more anxious to meet the market. In Feeding Grains the trade for export was only moderate.

POTATORS.—Throughout the Commonwealth values were taller than usually obtainable at the time of year; this, owing to the yields being much lighter. Consequently growers are not any too eager to quit, so that traders at times experienced a difficulty in filling orders, and, to make up the shortages, parcels of Tasmanians have been regularly brought along. Meanwhile values in "Gambiers" have fluctuated a good deal. ONIONS. As stocks of these are now in fewer hands, the market continues firm, although the business put through has only been of a limited character.

DAIRY PRODUCE.—In the Eastern States, prior to the break-up of drought conditions, holders of Butters there succeeded in booming prices until the highest selling rates for many a long day were touched; but with the setting in of such general rains the inevitable slump had to be faced. In South Australia the demand for fresh prints was unusually heavy, the tendency at times being towards extreme figures, which were only prevented owing to parcels of bulk offering. Eggs have had a good month's business, and established an advance of about 5d. per dozen; but, as holders of refrigerated and pickled sorts are now offering freely, any immediate rise is precluded. Cheese.—The advance in Butter values caused cheesemakers to somewhat neglect this, until the factories were almost depleted of stocks, so that a sharp rise of nearly 2d. per lb. was effected. Bacon.—The depression that continued in this line has been removed, on account of the lesser number of hogs marketed, coupled, at the same time, with the heavier demand, which is responsible for the now decided improvement in the Bacon trade. Hams had very little call, and to effect quittances curers were prepared to quote at a reduction. Honey found steady trade, but sales were mostly for South Australian wants. Almonds.—Owing to old season's stocks overlapping, the market for the new crop has not opened any too strong, buyers preferring to hold off for the present.

LIVE POULTRY.—No doubt the scarcity of feed is responsible for the poor condition generally of the poultry coming forward, which had a depressing effect upon selling rates; but, as the month advanced, an improvement in the quality of the birds was noticeable, when correspondingly higher rates were secured.

CARCASE MEAT.—With the setting in of winter conditions, consignments of Pork and Veal are coming to hand for the Friday's auction, and good sales have been made, the demand being strong for prime shop Porkers weighing 60 to 90 lb.; while Baconers, 120 to 135 lb., sold well. Choppers and heavier weights less money, according to quality. In Vealers, the market has been bare of prime dairy fed, and satisfactory prices obtainable: but for thin or poor sorts there is the usual difficulty in quitting.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, $3/0\frac{1}{2}$ to $3/0\frac{3}{4}$ per bushel of 60 lb.

FLOUR.—City brands, £8/-/-; country, £7/5/- to £7/10/-.

BRAN. 1/-; Pollard, 1/-, per bushel of 20 lb.

OATS.—Local Algerian and Dun, 2/-, prime; White Champions, $2/1\frac{1}{2}$ to 3/-, prime.

BARLEY.—Cape, $2/4$ to $2/5$ per bushel, for seed samples.

CHAFF.—£3/-/- to £3/5/- per ton of 2,240 lb.. f.o.b. Port Adelaide, for prime green new.

POTATOES.—Gambiers, £6/5/- to £6/10/- per ton of 2,240 lb.

ONIONS.—New locals, £10/-/- to £11/-/-, for prime, per ton of 2,240 lb.

BUTTER.—Factory, Creamery, and choice Separators, fresh, in prints, $1/2$ to $1/4\frac{1}{4}$; fair Dairies to ordinary Separators, 11d. to $1/1$; Stores and Collectors' lots, 9d. to 11d.; Victorian bulk, 1/- to $1/1$; New South Wales, from 10d. to $10\frac{1}{2}$ d.

CHEESE.—Prime new make, $6\frac{1}{2}$ d. to $7\frac{1}{2}$ d. per lb.

BACON.—Factory-cured sides, $6\frac{1}{2}$ d.

HAMS.—S.A. factory, 8d.

EGGS.—Loose, $1/4$.

LARD.—Skins, $5\frac{1}{2}$ d.; tins or bulk cases, $4\frac{1}{2}$ d. per lb.

HONEY.— $2\frac{1}{2}$ d. for prime, clear, extracted new season's; Beeswax, $1/1$ per lb.. cased aboard.

ALMONDS.—Soft shells (Brandis), 4d.; kernels, 8d. per lb., in single sacks. f.o.b.

LIVE POULTRY.—Heavy-weight table roosters, worth $1/8$ to $2/2$ each; plump hens and fair-conditioned cockerels, $1/2$ to $1/7$; mixed sorts, $1/-$ to $1/2$; poor and weedy, 9d. to 11d.; ducks, $1/4$ to $2/-$; geese, $2/6$ to $3/3$; pigeons, 4d.; turkeys, from $4\frac{1}{2}$ d. to $6\frac{1}{2}$ d. per lb., live weight, for fair to good table birds.

CARCASE MEAT.—Bright shop porkers, $3\frac{1}{2}$ d. to $4\frac{1}{2}$ d. per lb.; medium pork to good baconers, $3\frac{1}{2}$ d. to $3\frac{3}{4}$ d.; choppers, $2\frac{1}{2}$ d. to 3d.; prime dairy veal, $3\frac{1}{2}$ d. to $4\frac{1}{2}$ d.; medium sorts, 2d. to 3d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

SOUTH AUSTRALIA.—AGRICULTURAL

Return showing the Area of Wheat Sown, the Area Reaped, the Quantity Produced, and
and 1904-5 respectively ; also the Area of Wheat Cut for Hay, the Produce

Division and County.	Area under Wheat.				Produce—Wheat.	
	Sown.		Reaped.			
	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.
	Acres.	Acres.	Acres.	Acres.	Bushels	Bushels.
I. CENTRAL—						
Adelaide ..	15,510	15,738	15,510	15,738	164,160	195,467
Albert ..	32,458	36,134	31,792	36,134	177,200	130,653
Alfred ..	14,802	18,715	14,432	18,715	105,985	48,178
Carnarvon ..	120	1,326	120	1,326	1,250	13,346
Eyre ..	98,160	113,458	93,718	77,583	672,934	291,745
Fergusson ..	113,085	127,680	113,085	127,680	1,170,645	1,121,926
Gawler ..	110,126	105,484	95,380	105,484	1,023,568	1,143,710
Hindmarsh ..	12,156	18,245	12,156	18,245	123,514	138,490
Light ..	101,512	85,878	81,087	82,656	912,435	873,852
Sturt ..	66,565	71,237	64,636	71,237	454,742	364,503
Total ..	564,494	593,895	521,916	554,798	4,806,433	4,321,870
Increase ..	—	29,401	—	32,882	—	—
Decrease ..	—	—	—	—	—	484,563
II. LOWER NORTH—						
Burra ..	29,450	42,376	27,452	17,345	192,780	66,752
Daly ..	204,156	226,710	191,838	226,710	1,735,718	1,961,376
Hamley ..	—	—	—	—	—	—
Kimberley ..	28,295	31,925	26,134	25,346	180,653	85,952
Stanley ..	130,153	131,752	120,623	131,752	1,441,892	1,293,524
Victoria ..	145,147	140,962	125,397	140,962	1,512,893	1,371,386
Young ..	3,725	7,645	3,725	5,320	18,760	9,375
Total ..	540,926	581,370	495,169	547,435	5,082,696	4,788,365
Increase ..	—	40,444	—	52,266	—	—
Decrease ..	—	—	—	—	—	294,331
III. UPPER NORTH—						
Blachford ..	8,600	12,165	8,022	12,165	26,160	38,621
Dalhousie ..	138,944	143,748	137,240	134,258	923,942	702,535
Derby ..	—	—	—	—	—	—
Frome ..	137,920	133,692	123,826	121,610	827,902	629,836
Granville ..	43,720	51,530	42,527	41,283	87,450	53,154
Hanson ..	15,245	23,462	15,245	23,462	40,672	52,970
Herbert ..	11,530	7,520	11,094	5,245	44,185	8,510
Lytton ..	—	—	—	—	—	—
Newcastle ..	40,468	45,336	36,826	40,537	102,143	89,658
Taunton ..	—	—	—	—	—	—
Total ..	396,427	417,453	374,780	378,560	2,052,454	1,575,284
Increase ..	—	21,026	—	3,780	—	—
Decrease ..	—	—	—	—	—	477,170

STATISTICS—SEASON 1904-1905.

the Average Yield per Acre in each Division and County during the Seasons 1903-4 and the Average Yield per Acre, together with the Annual Rainfall.

Average Yield per Acre.				Wheat for Hay.						Rainfall (Approximate Mean).	
Sown.		Reaped.		Area.		Produce.		Average Yield per Acre.			
1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903.	1904.
Bushels.	Bushels.	Bushels.	Bushels.	Acres.	Acres.	Tons.	Tons.	Tons.	Tons.	Inches.	Inches.
10.60	12.42	11.41	12.42	60,387	45,724	94,250	68,935	1.56	1.51	31.55	26.37
5.46	3.62	5.57	3.62	2,549	2,415	2,150	1,637	.84	.68	14.42	8.42
7.16	2.57	7.34	2.57	1,452	845	1,364	373	.94	.44	14.56	7.91
10.42	10.82	10.42	10.82	610	1,024	762	1,316	1.25	1.29	21.54	19.36
6.86	2.57	7.18	3.76	12,175	7,256	11,676	3,825	.96	.53	15.61	9.19
10.35	8.79	10.35	8.79	16,700	15,275	18,163	14,185	1.09	.93	18.41	15.80
9.29	10.84	10.73	10.84	39,647	20,412	57,864	25,324	1.46	1.24	20.55	15.31
10.16	7.59	10.16	7.59	10,823	9,867	13,614	10,146	1.26	1.03	27.25	22.38
8.99	10.18	11.25	10.57	41,150	27,172	58,682	31,908	1.43	1.17	25.35	16.82
6.83	5.10	7.04	5.10	12,187	10,260	12,140	7,218	1.00	.70	18.30	12.81
8.51	7.28	9.21	7.79	197,680	140,250	270,665	164,867	1.37	1.18	20.75	15.44
—	—	—	—	—	—	—	—	—	—	—	—
—	1.23	—	1.42	—	57,430	—	105,798	—	.19	—	5.31
6.55	1.58	7.02	3.85	4,217	1,598	4,314	773	1.02	.48	18.96	10.16
8.50	8.65	9.05	8.65	23,900	24,584	27,176	25,356	1.14	1.03	18.58	15.38
—	—	—	—	283	—	350	—	1.24	—	14.56	7.91
6.38	2.69	6.91	3.39	2,315	940	2,027	512	.90	.54	16.71	11.44
11.08	9.82	12.00	9.82	25,327	18,653	34,285	19,216	1.35	1.03	24.17	15.18
10.42	9.73	12.07	9.73	41,230	26,565	60,232	30,638	1.46	1.15	21.05	15.80
5.04	1.23	5.04	1.76	410	—	410	—	1.00	—	14.42	8.42
9.40	8.24	10.26	8.75	97,682	72,340	128,794	76,495	1.32	1.06	18.35	12.04
—	—	—	.51	—	—	—	—	—	—	—	—
—	1.16	—	—	—	25,342	—	52,299	—	.26	—	6.31
3.04	3.17	3.26	3.17	430	387	376	268	.87	.69	15.31	12.99
6.65	4.89	6.73	5.23	16,715	9,392	17,163	7,649	1.03	.81	16.40	12.38
—	—	—	—	—	—	—	—	—	—	9.38	8.50
6.00	4.71	6.69	5.18	19,270	14,260	20,125	10,187	1.04	.71	17.93	12.62
2.00	1.03	2.05	1.29	554	—	397	—	.72	—	12.42	11.56
2.67	2.26	2.67	2.26	—	—	—	—	—	—	13.07	12.38
3.83	1.13	4.00	1.62	424	—	344	—	.81	—	12.16	11.24
—	—	—	—	—	—	—	—	—	—	10.14	9.76
2.52	1.98	2.57	2.21	2,187	2,196	1,768	1,516	.81	.69	15.72	11.46
—	—	—	—	—	—	—	—	—	—	12.02	11.14
5.18	3.77	5.48	4.16	39,580	26,235	40,173	19,620	1.01	.75	13.46	11.40
—	—	—	—	—	—	—	—	—	—	—	—
—	1.41	—	1.32	—	13,345	—	20,553	—	.26	—	2.06

SOUTH AUSTRALIA.—AGRICULTURAL

Return showing the Area of Wheat Sown, the Area Reaped, the Quantity Produced, and and 1904-5 respectively; also the Area of Wheat Cut for Hay, the Produce

Division and County.	Area under Wheat.				Produce—Wheat.	
	Sown.		Reaped.			
	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.
	Acres.	Acres.	Acres.	Acres.	Bushels.	Bushels.
IV. SOUTH-EASTERN—						
Buccleuch ..	6,265	4,920	6,265	4,920	38,636	24,615
Buckingham ..	18,517	22,498	18,517	22,498	170,720	226,540
Cardwell ..	210	220	210	220	840	1,320
Chandos ..	115	256	115	256	1,296	1,028
Grey ..	9,162	8,247	9,162	8,247	106,425	112,326
MacDonnell ..	1,013	1,692	1,013	1,692	12,592	20,540
Robe ..	1,264	2,653	1,264	2,653	12,420	26,814
Russell ..	11,984	13,430	11,984	13,430	58,358	48,195
Total ..	48,530	53,916	48,530	53,916	401,287	461,378
Increase ..	—	5,386	—	5,386	—	60,091
Decrease ..	—	—	—	—	—	—
V. WESTERN—						
Buxton ..	—	—	—	—	—	—
Dufferin ..	2,010	3,794	2,010	3,794	8,130	8,976
Flinders ..	21,894	25,872	18,195	25,872	180,135	181,695
Hopetoun ..	6,103	6,590	6,103	6,590	24,285	25,382
Jervois ..	26,198	34,126	25,195	34,126	112,386	167,293
Kintore ..	14,726	17,180	12,686	17,180	51,370	62,840
Manchester ..	—	—	—	—	—	—
Musgrave ..	9,416	11,270	8,796	11,270	63,192	72,495
Robinson ..	40,264	47,145	40,264	47,145	234,732	206,357
Way ..	40,186	47,546	40,186	47,546	192,365	151,237
York ..	—	—	—	—	—	—
Total ..	160,797	193,523	153,435	193,523	866,595	876,275
Increase ..	—	32,726	—	40,088	—	9,680
Decrease ..	—	—	—	—	—	—
SUMMARY.						
I. CENTRAL ..	564,494	593,895	521,916	554,798	4,806,433	4,321,870
II. LOWER NORTH ..	540,926	581,370	495,169	547,435	5,082,696	4,788,365
III. UPPER NORTH ..	396,427	417,453	374,780	378,560	2,052,454	1,575,284
IV. SOUTH-EASTERN ..	48,530	53,916	48,530	53,916	401,287	461,378
V. WESTERN ..	160,797	193,523	153,435	193,523	866,595	876,275
Grand Total ..	1,711,174	1,840,157	1,593,830	1,728,232	13,209,465	12,023,172
Increase ..	—	128,983	—	134,402	—	—
Decrease ..	—	—	—	—	—	1,186,293

STATISTICS.—SEASON 1904-1905—*continued*.

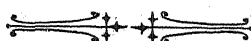
the Average Yield per Acre in each Division and County during the Seasons 1903-4 and the Average Yield per Acre, together with the Annual Rainfall.

Average Yield per Acre.				Wheat for Hay.						Rainfall (Approximate Mean).	
Sown.		Reaped.		Area.		Produce.		Average Yield per Acre.			
1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903.	1904.
Bushels	Bushels	Bushels	Bushels	Acres.	Acres.	Tons.	Tons.	Tons.	Tons.	Inches.	Inches.
6.17	5.00	6.17	5.00	454	400	370	217	.81	.54	20.12	14.08
9.27	10.07	9.27	10.07	4,212	2,570	5,093	2,810	1.21	1.09	20.10	17.26
4.00	6.00	4.00	6.00	66	60	90	30	1.36	.50	21.05	18.03
11.27	4.00	11.27	4.00	65	60	50	50	.77	.83	18.03	14.73
11.62	13.62	11.62	13.62	11,216	10,370	15,476	14,935	1.38	1.44	33.93	27.01
12.43	12.14	12.43	12.14	1,672	1,182	2,450	1,300	1.47	1.10	26.30	20.27
9.83	10.11	9.83	10.11	3,564	3,698	4,517	4,572	1.27	1.24	27.02	21.11
4.87	3.59	4.87	3.59	2,215	2,318	2,238	1,826	1.01	.79	17.32	12.23
8.27	8.56	8.27	8.56	23,464	20,658	30,284	25,740	1.29	1.25	22.98	18.09
—	.29	—	.29	—	—	—	—	—	—	—	—
—	—	—	—	—	2,806	—	4,544	—	.04	—	4.89
—	—	—	—	—	—	—	—	—	—	—	—
4.04	2.37	4.04	2.37	223	140	270	50	1.21	.36	12.78	10.13
8.23	7.20	9.90	7.02	3,530	3,792	3,730	3,815	1.06	1.01	20.74	17.53
4.00	3.85	4.00	3.85	186	120	160	80	.86	.67	15.75	13.25
4.29	4.90	4.46	4.90	1,898	1,432	1,127	1,045	.60	.73	13.04	10.48
.49	3.66	4.05	3.66	845	180	648	112	.77	.62	15.43	12.57
—	—	—	—	—	—	—	—	—	—	9.98	8.26
6.71	6.43	7.30	6.43	1,524	1,207	1,324	763	.90	.63	18.45	15.32
5.83	4.37	5.83	4.37	2,160	2,315	1,392	1,227	.64	.53	16.41	13.02
4.79	3.18	4.79	3.18	1,380	957	1,156	438	.84	.46	17.62	12.57
—	—	—	—	—	—	—	—	—	—	13.67	9.54
5.39	4.53	5.64	4.53	11,746	10,143	9,807	7,530	.83	.74	15.39	12.27
—	—	—	—	—	—	—	—	—	—	—	—
—	.86	—	1.11	—	1,603	—	2,277	—	.09	—	3.12
—	—	—	—	—	—	—	—	—	—	—	—
8.51	7.28	9.21	7.79	197,680	140,250	270,665	164,867	1.37	1.18	20.75	15.44
9.40	8.24	10.26	8.75	97,682	72,340	128,794	76,495	1.32	1.06	18.35	12.04
5.18	3.77	5.48	4.16	39,580	26,235	40,173	19,620	1.01	.75	13.46	11.40
8.27	8.56	8.27	8.56	23,464	20,658	30,284	25,740	1.29	1.25	22.98	18.09
5.39	4.53	5.64	4.53	11,746	10,143	9,807	7,530	.83	.74	15.39	12.27
7.72	6.53	8.29	6.96	370,152	269,626	479,723	294,252	1.30	1.09	18.19	13.85
—	—	—	—	—	—	—	—	—	—	—	—
—	1.19	—	1.33	—	100,526	—	185,471	—	.21	—	4.34

MONTHLY RAINFALL.

The following table shows the rainfall for the month of April, 1905:—

Adelaide ...	3.66	Hoyleton ...	2.02	Macclesfield ...	4.90
Hawker ...	0.36	Balaklava ...	2.56	Meadows ...	6.18
Cradock ...	0.41	Port Wakefield ...	4.21	Strathalbyn ...	3.34
Wilson ...	0.60	Saddleworth ...	2.24	Callington ...	3.94
Gordon ...	0.33	Marrabel ...	2.50	Langhorne's Bridge	2.52
Quorn ...	1.03	Riverton ...	1.96	Milang ...	2.68
Port Augusta ...	0.70	Tarlee ...	1.82	Wallaroo ...	3.11
Port Germein ...	2.56	Stockport ...	1.85	Kadina ...	2.49
Port Pirie ...	1.63	Hamley Bridge ...	1.72	Moonta ...	2.90
Crystal Brook ...	3.19	Kapunda ...	2.09	Green's Plains ...	3.28
Port Broughton ...	2.88	Freeling ...	2.36	Maitland ...	2.53
Eute ...	3.08	Stockwell ...	2.04	Ardrossan ...	2.04
Hammond ...	1.48	Nuriootpa ...	2.06	Port Victoria ...	4.18
Bruce ...	0.56	Angaston ...	2.50	Curramulka ...	3.08
Wilmington ...	3.06	Tanunda ...	2.13	Minlaton ...	3.56
Melrose ...	3.76	Lyndoch ...	2.78	Stansbury ...	3.83
Booloroo Centre ...	1.60	Mallala ...	2.32	Warooka ...	3.53
Wirrabara ...	2.29	Roseworthy ...	2.32	Yorke town ...	3.78
Appila ...	1.95	Gawler ...	2.77	Edithburg ...	3.14
Laura ...	3.47	Smithfield ...	2.59	Fowler's Bay ...	0.81
Caltowie ...	2.52	Two Wells ...	2.20	Streaky Bay ...	1.45
Jamestown ...	2.43	Virginia ...	3.37	Port Elliot ...	2.09
Gladstone ...	3.44	Salisbury ...	2.44	Port Lincoln ...	2.41
Georgetown ...	3.83	Tea Tree Gully ...	3.68	Cowell ...	3.01
Narridy ...	2.98	Magill ...	4.28	Queenscliffe ...	2.96
Redhill ...	1.97	Mitcham ...	4.74	Port Elliot ...	5.28
Koolunga ...	2.36	Crafers ...	5.75	Goolwa ...	4.36
Carrieton ...	1.22	Clarendon ...	6.10	Meningie ...	2.61
Eurelia ...	1.46	Morphett Vale ...	4.34	Kingston ...	2.23
Johnsburg ...	0.64	Noarlunga ...	3.99	Robe ...	1.73
Orroroo ...	0.83	Willunga ...	4.91	Beachport ...	0.76
Black Rock ...	0.93	Aldinga ...	3.40	Coonalpyn ...	2.28
Petersburg ...	1.44	Normanville ...	5.48	Bordertown ...	3.74
Yongala ...	1.65	Yankalilla ...	5.59	Wolseley ...	3.21
Terowie ...	1.04	Eudunda ...	2.13	Frances ...	3.43
Yarcowie ...	1.51	Truro ...	2.01	Naracoorte ...	3.64
Hallett ...	2.06	Palmer ...	4.30	Lucindale ...	2.24
Mt. Bryan ...	1.41	Mount Pleasant ...	4.68	Penola ...	3.08
Burra ...	1.75	Blumberg ...	4.62	Millicent ...	3.69
Snowtown ...	2.78	Gumeracha ...	4.26	Mount Gambier ...	2.19
Brinkworth ...	2.62	Lobethal ...	5.12	Wellington ...	1.90
Blyth ...	3.13	Woodside ...	5.24	Murray Bridge ...	3.46
Clare ...	3.58	Hahndorf ...	4.80	Mannum ...	4.78
Mintaro Central ...	2.83	Nairne ...	6.14	Morgan ...	1.66
Watervale ...	2.98	Mount Barker ...	4.62	Overland Corner ...	2.20
Auburn ...	2.49	Echunga ...	5.34	Renmark ...	0.68
Manoora ...	2.31				



SOUTHERN CONFERENCE.

The Twelfth Annual Conference of the Southern Branches of the Agricultural Bureau was held at Strathalbyn on Thursday, March 31, when the following members of the Bureau were present:—Meadows—Messrs. Pearson, Clatworthy, Ellis, and W. J. and C. E. Stone. Woodside—Mr. Caldwell. Finnis—Messrs. T. and S. Collett and Henley. Port Elliot—Messrs. W. W. and W. E. Hargreaves and Welch. Hartley—Messrs. Stanton, Brooks, and Wundersitz. Kanmantoo—Messrs. Mills, Downing, and Lehmann. Strathalbyn—Messrs. M. and W. M. Rankine, Fischer, Butler, Reed, Mitchell, Watt, Meikle, Tucker, Cockburn, McAnaney, and Cheriton.

In addition a number of visitors, including Sir Lancelot Stirling, Messrs. G. Quinn (Horticultural Instructor), P. H. Suter (Dairy Instructor), and D. F. Laurie (Poultry Expert), were present.

In the absence of the Hon. Minister of Agriculture, Sir Lancelot Stirling occupied the chair, and in a short address explained the purpose and value of these annual gatherings, and welcomed the visitors.

On the motion of Mr. Cheriton, it was decided to send a resolution of sympathy and condolence to the family of the late Mr. F. Krichauff.

THE FARMER: HIS FRIENDS AND ADVISERS.

Mr. R. Caldwell, of Woodside, read a paper on this subject, and a short discussion ensued.

TREE AND HEDGE PLANTING.

Mr. H. B. Welch, of Port Elliot, read a paper on this subject. He felt it a duty to help to keep prominently before the public the desirability of treeplanting for timber and for shelter for stock. While he was pleased to see a lot of the poor scrub land being cleared and put to profitable use he hoped that the farmers would make a point of leaving clumps of trees for shade and shelter. He did not mean to leave small undergrowth to shelter rabbits, but trees suitable for shelter. If these did not exist, he would advise planting small clumps of Aleppo pines, shea-oaks, pepper trees, carobs, gums, or wattle. This particularly referred to the Northern treeless plains. During a recent trip through the North he had been much struck with the wonderful improvement in the appearance of Jamestown, Gladstone, Laura, Balaclava, Quorn, and other towns through the successful planting of timber. He thought the efforts of the Government to encourage treeplanting were worthy of praise, and he would like to see a large extension of this work. Was it not possible to grow all the timber required for railway sleepers, mining work, building material, etc., instead of having to import so much? If so, the industry would afford profitable employment to a large number of people. He would impress upon those intending to plant trees the necessity for thorough preparation of the land, and also for attending to and protecting the young trees for a year or two. In regard to hedges, these were needed to give protection around the paddocks, especially near the coast. The main question was: "Which is the best hedge to plant?" Many of them had experience of the sweet briar, prickly pear, kangaroo hedge, and gorse, each of which had become a great nuisance, covering hundreds of acres of land and affording harbour to rabbits. These hedges should be got rid of as quickly as possible. Another objectionable hedge was the African boxthorn. The thorny clippings were dangerous, and the birds carried off the fruits, thus distributing the seeds about the paddocks. The best hedge for shelter and rapid growth in this district was the so-called Tagosaste. It required a double fence to protect it from stock, and where rabbits and hares were plentiful wire-netting was required. The Port Lincoln wattle was another rapid-growing breakwind. Cattle did not touch it, but it must be cut frequently to make it look nice. The olive has the great objection of slow growth, but it has much to recommend it. The tree will stand the sea breezes and last a lifetime. The broad-leaved wattle could also be profitably grown for shelter. A few acres will afford good shelter for stock, and will return a nice sum for the bark. A good plan is to fence off a strip for wattles, so that the cattle cannot get at them.

DAIRYING INDUSTRY.

Mr. P. H. Suter (Dairy Instructor) gave an address on dairying. He considered dairying carried on under a proper system as profitable as any branch of agriculture. The immense importance of the industry to Den-

mark, New Zealand, and Victoria was referred to, and figures quoted to show the progress of dairying in those countries. He considered that there was much room in South Australia for the expansion of the industry. The most important factors in building up the industry were:—1. Breeding the herd. 2. Feeding. 3. Comfort of stock. 4. Treatment of the milk and cream. 5. Cleanliness. The South Australian dairy cows on the whole yielded considerably less than in Victoria. They must endeavour to improve the quality of their herds. This was best done by using purebred selected bulls and rearing the heifer calves from the best milkers. They should keep a record of the quantity and quality of milk given by each cow, and weed out those that were unprofitable. For improving their stock he favoured the milking strain of Shorthorn. In regard to the second point, no matter how good the breeding, good feeding was essential. Without plenty of suitable food they could not get a large milk yield. Consideration must be given to the supply of succulent food when the natural herbage was dry. They should grow green crops for immediate use and for ensilage, and, where possible, attention should be given to lucerne. Good clean drinking water in abundance must be provided. They should bear in mind the fact that of 100 lb. of milk 87 lb. consisted of water. The comfort of stock was next touched on, and the worrying of the cows by dogs condemned. Shelter sheds or hedges for protection added to the comfort of the cows and to the milk yield. If these cannot be provided, the cows should be rugged during the cold weather, but the rugs were somewhat of a nuisance. Special attention was given to the necessity for cleanliness in all work connected with dairying. The hand separator was referred to as a curse to the industry, not because of any defect in the machine, but on account of the way the cream was handled by the dairymen. In the hands of an intelligent man, who paid particular attention to cleanliness, provided a suitable place to keep the cream, and delivered the cream frequently to the factory, the hand separator was a valuable asset. Under present conditions, however, it was without doubt responsible for the inferior quality of much of the butter produced in South Australia. A considerable number of questions were asked and answered.

WHEAT SEEDING.

Mr. F. Lehmann, of Kanmantoo Branch, read the following paper:—"The eastern slopes of the Mount Lofty Ranges, where the rainfall averages between 18 and 20 inches, need different treatment to most of the wheat soils of South Australia. The country is hilly, and the soil, which is of a sandy loam, fairly firm, and with a good clay subsoil, tends to be rather cold in winter. It should be fallowed in August or September; if done earlier the land sets too hard. Plough to a depth of 5 to 6 in., and harrow at once. On the appearance of stinkwort harrow or cultivate at once, as the plant is easily destroyed when young. If the tilth is good I do not think it advisable to cultivate during summer, as the land is liable to drift. The most important part of wheatgrowing is the time to put in the crop, mostly on account of weeds, of which the so-called dandelion, or Cape weed, is the most troublesome. I have known crops to be put in in April on well-worked fallow: the wheat promised a 30-bushel crop, but instead of ripening it died off on account of the heavy growth of this weed. I find it best to cultivate directly after rain: in about four or five days the young weeds will show; then drill and harrow during fine weather, and the young plants will be destroyed. If the ground should be wet and weedy the paring or skim plough is the best implement to use, as the plants are cut off and turned over to a depth of two or three inches. Do not drill or harrow during wet weather, as it forms a caked surface. For early reaping the Mellow Comeback comes first; it is rustproof, and stands well. For main crop the Silver King is a good vielder, and during two rusty seasons has proved rustproof, but there are signs of its weakening. For hay there is none so good as the White Tuscan; on clean, strong ground it grows as tall as any, and better quality. On a piece of land dirty with oats sow an early wheat, as it can be cut when oats still have the grain. Sow not less than one bushel of seed, and from one to one and a half cwt. super per acre. A great deal of the final result depends on the start the wheat plants get; if sown too early, in half-moist soil, some of the seed malts, and the remainder comes up sickly; when a good rain does come, the weeds get the best of the wheat, and the crop is apt to die off with take-all. The cleanest and heaviest crop I have had was on land cultivated in a dry state in April, followed by a good rain; it was left three or four days, and drilled and harrowed during fine weather."

LAND, BUREAU, AND CONGRESS WORK.

Mr. W. E. Hargreaves, of Port Elliot, read a paper under the above title.

DEFECTS IN EXPORT FRUITS.

Mr. George Quinn gave a short address dealing with some important defects in a few of the principal export apples. The April issue of *The Journal of Agriculture* contains a full report, with illustrations.

THE POULTRY INDUSTRY.

Mr. D. F. Laurie gave an address on this subject. He dealt with the possibilities of the industry, and mentioned that the export of eggs had increased in value very rapidly of late, and last year reached £112,000. South Australia should secure a share of England's poultry trade. The market for eggs and good table poultry was practically unlimited. In poultry management, breeding, housing, and feeding are the main points of importance. More attention should be given to turkey breeding, as South Australian conditions were very favourable. The scrubby country around the Finnis was eminently suitable for turkey rearing. The birds would have a free run, and would pick up most of their food. If they could not afford to buy purebred turkey hens they should at least use only good gobblers, the American Bronze preferred. For shelter, a low, roomy shed, with plenty of ventilation, would be required.

THE HEADER.

Mr. P. A. Cockburn, of Strathalbyn, read a paper on the use of the binder and header for harvesting grain crops. He was a strong advocate for this method of harvesting, on the smaller farms at any rate. On such farms the straw, cavings, etc., were very useful for stock, and even on larger holdings, he ventured to say, it would pay to harvest a portion of the crop with binder and header. There was no doubt that when the wheat was cut before the grain was hard, and allowed to ripen in the stook, it made the best sample. While in the stook it drew nutriment from the straw, and both in weight and quality the grain was superior to that left until fit to strip. Then, again, by the use of the binder such rubbish as cockspur, poppies, wild oats, etc., was removed with the crop, which gives the farmer a better chance of cleaning his land. Finally, in a rusty year, cutting with the binder was a great factor in the production of a good sample. About four years ago he put in a small patch in an out-of-the-way place, and as he was cutting some crop in the vicinity for a neighbour he also cut this piece when it was just turning yellow. Being too ripe for hay he threshed out the grain, and had a magnificent sample. A few weeks later, on walking across the land where the crop had been cut, he found a number of plants that had been missed. He broke off the heads and rubbed them in his hand, and got only a poor sample of chicken feed. This was due to rust. Mr. Cockburn exhibited several photographs showing his threshing plant, and referred to an article in the February issue of *The Journal of Agriculture* for particulars of work done by the header. He stacked his crop, and headed it from the stack. Four men on a light crop put through three bags per hour, but in a 20-bushel crop he was satisfied that they could do five bags per hour. The grain from the header was splendid for seed, very few being cracked. His plant was driven by a $9\frac{1}{2}$ h.p. Trusty oil engine, consuming about 3s. worth of oil per day. He was satisfied that he could, with a few alterations, improve the output of the plant. Instead of burning or wasting the straw, under this system it could be put to good use. The header could be worked by either horsepower or engine, but the latter was by far the better.

SOUTH-EASTERN CONFERENCE.

The Annual Conference of the South-Eastern Branches of the Agricultural Bureau was held at Naracoorte on Wednesday, April 5. Meetings were held in the morning, afternoon, and evening, and were well attended. The following members of the Agricultural Bureau were present:—Naracoorte Branch—Messrs. J. G. Forster, Attiwill, Coe, Caldwell, Wardle, McLay, Williams, Duffield, and H. A. Forster. Kingston—Messrs. Wight, F. W.

and G. Barnett, Clarke, and Redman. Mount Gambier—Messrs. Pick, Williams, Ruwoldt, and Sassanowsky. Penola—Messrs. Darwent, Richardson, and Stonev. Lucindale—Messrs. Feuerheerdt, Tavender, Williams, and Langberg. Millicent—Messrs. Holzgreffe and Campbell. Tatiara—Messrs. Fisher and Stanton. The Department of Agriculture was represented by the Secretary for Agriculture (Professor Angus), and Messrs. G. Jeffrey (Wool Instructor), Geo. Quinn (Horticultural Instructor), P. H. Suter (Dairy Instructor), and W. L. Summers (Chief Clerk); and the Council of Agriculture by Messrs. R. Caldwell and A. Molineux.

CHAIRMAN'S ADDRESS

Mr. J. G. Forster (Chairman of the Naracoorte Branch) presided, and in a short address declared the Conference opened. He referred to the purpose of the gathering, and welcomed the visitors, especially Professor Angus and Mr. Suter, neither of whom had visited the district previously.

AGRICULTURAL BUREAU MEMBERSHIP.

Professor Angus said he wished to offer a few remarks on the question of the recent alterations in the membership rules, about which there seemed to be some misunderstanding. It was necessary that all proposed new members should have the approval of two-thirds of the members of the Branch. Some Secretaries had suggested that this rule would be unworkable, as so often there were not the required number of members present. So far as he could see, this was easily overcome. It should be the practice to submit the name of any proposed new member at one meeting, and deal with it at the next. The Hon. Secretary could then in calling the meeting mention the name proposed, and ask each member, if unable to be present, to indicate in writing his approval or otherwise of the proposed new member. In this way there should be no difficulty in securing the necessary two-thirds majority in favour of any desirable nominee.

Mr. Campbell thought it would be well to make some rule as to how the election of new members should be carried out, and also when, as from the circular issued by the Department it would almost appear that nominations would require to be dealt with at the July meeting each year.

Mr. Summers, in reply to question, said nominations could be made at any time. One-third of the members must retire in June each year, and it would doubtless be the usual practice to reinstate desirable ones the following meeting; but this was entirely a matter for the Branch to decide. The practice of the Department had been to make the Branches as nearly self-governing as possible.

FACTORS IN FERTILITY.

Professor Angus gave an address on this subject. It was, perhaps, somewhat difficult to make clear to them what he mean by fertility: but he proposed to consider it as implying the capacity of the land to produce crops. In the soil there existed large supplies of plant food, some part being in a form in which the roots of the crop could readily make use of it: but by far the greater proportion was not immediately available. It was to this reserve store of plant food, which, by exposure to the influence of sun and air, and by cultural operations, gradually became soluble, that their attention was directed. He desired to refer to several factors which had an important influence on this question. The first was drainage; not surface drainage, but underground. They wanted the water to pass through the soil, and any excess should be removed by underdrains. With the water air was also carried through the soil, and, as previously pointed out, air was an important factor in the conversion of insoluble plant food to available forms. Then lime was another agent that should be utilised. It might seem strange to some of them to suggest the application of lime in a district where there was so much limestone rock; but the presence of limestone under the soil was not proof of the presence of a sufficiency of lime in the surface layers. Freshly reclaimed swamp land, heavy, black, or sour land, were all benefited by the application of lime. Besides the direct action of lime, he must not forget to mention that its application had an important effect on the increase of bacterial action in the soil. Good cultivation was another important factor in soil fertility. It had struck him that in South Australia sufficient attention was not given to this point. Large farms were usually obstacles to good cultivation, by

which term he meant deep and thorough working of the land. The soil should be thoroughly opened up, to permit the access of air and moisture. They could not stir the soil too deeply, provided they did not bring the raw subsoil to the surface. If the soil is deep, plough deeply; but if not, plough as deep as advisable, and break up the lower layers with another plough, but without bringing it to the surface. Included in good cultivation was the proper working down of the soil preparatory to seeding, and in this connection he was sorry to see that on many farms harrows were little used. He was a strong advocate of the diamond-tooth harrows. Other factors he would mention were clean cultivation and a good rotation. Some crops were part of the actual preparation for another crop. Most of them had seen how a cereal crop benefited from the growing of a leguminous crop. These leguminous plants were the hosts of certain bacteria possessing the power to obtain nitrogen from the air, which was always present in well-cultivated soils. Then other plants improved the soil, on account of their deep-rooting habits. In dealing with crop rotation they must consider the question of the utilisation of their crops, and he would strongly recommend them to give increased attention to dairying.

Some discussion ensued on deep cultivation, Messrs. Molineux and Caldwell instancing cases where the land had been ruined for a number of years through being ploughed too deeply. Professor Angus said he emphasised the difference between deep cultivation and deep ploughing. Where the soil was shallow, and the subsoil good, he would, however, advise them to deepen the feeding area of the crop by occasionally bringing up a little of the subsoil, and exposing it to the ameliorating influence of the weather. Mr. Fisher said he could bear out Professor Angus' remarks. There were some subsoils that could with advantage be gradually mixed with the surface soil. He tried ploughing deeply on a small area of land, and, though the first crop was not quite so good as on land alongside, he had seen the benefit of late years. On one part of his land there was a small hollow, into which the water drained during the middle of winter. As no crop grew in this hollow, he filled it up a few years ago with clay from an excavation, and now on this area he got just as good, if not better, growth than on the surrounding land. In reply to inquiry as to treatment of the black flats, which formed into hard cubes in the summer, Professor Angus said, as the soil was heavily charged with organic matter, he would apply a good dressing of lime. The first dressing should be from 1 to 2 tons per acre, and, after two or three years, light annual dressings, say, 3 cwt. to 15 cwt. They should apply the lime in whatever form was handiest; usually freshly slaked lime spread over the land and harrowed in was the best.

THE AGRICULTURAL BUREAU.

Mr. A. Molineux gave a short address dealing with the formation of the Agricultural Bureau, and outlining some of the work accomplished.

AGRICULTURAL ORGANISATION.

Mr. Rowland Campbell read a paper on this subject to the following effect:—"In almost every quarter of the globe where agriculture is carried on this question is receiving much more than passing notice. Some months ago the *London Times* published a series of articles on the subject, and strong support was given to the principle of co-operation. More than all else, one striking fact, as against all others, that it gave prominence to, was that in every one of the countries largely supplying Britain with agricultural produce 'there had been an agricultural revival, which has led to the spreading throughout each of them of a more or less complete network of agricultural organisation, manifesting itself in the spread of agricultural education, and in combinations among the agricultural community for an endless variety of purposes, including the virtual transformation of farming methods in accordance with the latest developments of agricultural science; organisations for the obtaining of agricultural necessities of good quality at lesser cost: the purchase in common of costly machinery, which would otherwise be beyond the means of the small cultivator; the formation of co-operative societies, both of production and of sale; the setting up of agricultural credit banks, as a means of keeping the farmer out of the hands of the usurer, and enabling him to carry on his operations more successfully; and the improvement of the individual lot of the agriculturist in many ways. . . . ' Not one of the objects

mentioned was out of the reach of or adoption by every farming community in this and adjoining States. In Ireland there were in 1903:—

Co-operative Dairy Societies	...	...	...	...	289
Auxiliary Dairy Societies	...	...	...	...	74
Co-operative Agricultural Societies	...	...	...	...	140
Co-operative Agricultural Banks	...	...	...	...	195
Home Industries Societies	...	...	...	...	54
Poultry Societies	...	...	...	...	36
Beekeepers	...	...	...	...	28
Miscellaneous	...	...	...	...	22
Total	...	...	...	...	838

In Great Britain 29 agricultural supply and distributive societies, with £52,892 of capital, did business to the extent of £156,027, showing a profit of £6,112. The French, Russians, Danes, and others carry their organisation and mastery of detail to the highest state of perfection, and they have consequently made great headway. Standing about top is Denmark. She has made a most determined struggle against, and has successfully surmounted, the most adverse conditions which a country could be burdened with. By adopting the co-operative system of butter production, scientifically perfecting it, she leads the price for her exported surplus over every other country, and has now a most valuable and increasing trade. She followed this up with co-operative bacon factories and co-operative egg societies, and she has organised societies for the purchase of agricultural necessities—seeds, fertilisers, machinery, etc.—and for many other purposes besides, so that every branch of the agricultural industry is represented by its separate co-operative organisation. A farmer may be a member of no less than ten such societies. A writer on the subject says:—"The result of all this co-operative effort has brought about in Denmark changes that have been almost revolutionary in character, and the general prosperity of the country is greater than ever." There are in the country over 1,000 co-operative societies, with a total of 150,000 to 160,000 members, and a total annual turnover of over £2,000,000. She has nearly 1,100 creameries, and manufactured butter to the value of £8,400,000. Her annual exports of agricultural products exceed £14,000,000. Her bacon factories last year treated nearly a million pigs; her egg societies exported nearly 40,000,000 dozen eggs. Her export of agricultural produce is more than twice the whole of the exports of South Australia, yet her territory is not three times larger than the South-East proper. Much more might be said, but let them get to home matters. At present their export of butter only reaches for the season about 350 tons, while in Victoria, where co-operation was more general, the export is about 10,000 tons. Then the egg trade has never been, or never will be, worth anything as an industry till the business of collecting and selling is done co-operatively. There was no reason why farmers, co-operatively, should not do all their own stock agency and selling business, even to having an expert to handle and direct; and if they adopted a strict cash business for their transactions, in the long run they would find it all their own. All machinery, seeds, fertilisers could be dealt with; bark mills, bacon factories, butter factories, egg and poultry societies could be formed to deal with every product the land user produces or handles. The possibilities in the South-East alone of the dairying business, poultry and eggs, fat lambs for export, bacon curing, bark raising and crushing, and fruit-growing for export give wide scope and opportunities large for possibilities of success under co-operative management. But, as a last word, it will be better to grow into these things than rush into them."

A short discussion ensued. Mr. Molineux thanked the writer for the trouble he had taken in preparing his paper. He was a stong advocate for co-operation, but was not prepared to go as far as Mr. Campbell. There were many things referred to which could well be left alone. Mr. Fisher and Mr. Caldwell supported the paper. The latter said the difficulty was to get the farmers to co-operate. When they started the Onkaparinga Butter and Produce Company they could not get sufficient support from the dairymen, and were compelled to dispose of shares to others. Now, however, that the Company was prosperous, the milk suppliers were complaining because the non-suppliers on the share list were benefited, as they put it, "at their expense." Mr. Campbell said this, of course, was unfair. He strongly advocated purely co-operative companies, but where it was necessary to obtain outside capital fair interest should be paid. After paying, say, 5 per cent. on the capital of the company, the milk suppliers should receive any balance.

SHEEP DIPPING.

Mr. E. E. Feuerheerdt, of Lucindale, read the following paper on this subject:—'The losses caused by the presence of ticks or lice, or both, on sheep are so serious that dipping the flocks to rid them of these parasites is an absolute necessity, a fact which has long been realised and acted upon by most sheepowners in the South-East. But, unfortunately, their efforts are partly nullified by some sheepowners who do not seem to realise that the presence of these parasites does the harm that is actually done, and who do not trouble to dip at all, or do it in such a perfunctory manner that the result is little better than if not done at all, the result being that the ticks, and in some districts the sheep louse, are always to be contended against; for it is astonishing how quickly infested sheep can infest clean flocks grazing in adjoining paddocks. Sheep constantly worried and irritated by the parasites lose condition, and, losing condition, the growth of wool is interfered with; while the ticks also cause discolouration and stain the wool, which seriously affects its sale. Then there is the loss of wool occasioned by the sheep constantly rubbing, scratching, and biting itself, which is more noticeable where lice are present. Woolbuyers say that wool from ticky and lousy sheep is in an unhealthy condition. The fibre is unequal and weak, and the discolouration is difficult to get rid of. The presence of these parasites makes a well-arranged dipping-bath as much a necessity as a shearing-shed. I do not mean that every sheepowner should build a dip, as with many small holders it is better for them to combine and build a dip in common. Now, as to the form of dipping-bath: local conditions may require a long, short, or circular bath. It is generally recognised that a long swim-bath, about 60 feet, is the best. But, whatever style is used, it must be borne in mind that for dipping to be effective the sheep must be thoroughly soaked, and this requires an immersion of not less than a full minute. Therefore, with short baths, it is necessary to have a check-gate, so as to be able to keep the sheep in the bath the necessary time. The whole secret of success lies in the thorough soaking, and to secure this the work cannot be hurried over. Dipping sheep is hard work, and, as it generally occurs during hot weather, men are naturally inclined to try to get through the task in record time, and the work is then only half done. On clean country, where every sheep can be got at mustering, from one to six weeks after shearing is a suitable time for dipping. On rough country and scrubby heath, where musterers cannot always be depended upon to get every sheep, dip off shears, for you are then certain to get every sheep you shear. One ticky or lousy sheep missed in dipping will, by the end of the year, undo the whole work. It must be remembered that the more wool a sheep has at dipping time the longer will it take to get thoroughly soaked. Avoid dipping during wet weather or during the heat of the day, or late in the afternoon. It is a good plan to yard the sheep overnight, and dip early in the morning, finishing by 10 or 11 a.m., and leaving them for an hour to drain before taking back to their paddock. A poisonous dip is absolutely essential to cope with the parasites. Poisonous dips are more difficult to prepare, and require more attention when mixed; but the little extra trouble is amply compensated for in the ultimate result. Any of the well-known poisonous dipping compounds now on the market, if carefully used, will effectively kill the parasites. We use a dip which was recommended to us by Professor Lowrie, and is found in Luson's 'Veterinary Pharmacopœia.' Its component parts are:—Arsenic, 32 oz.; pearlash, 32 oz.; sulphur, 48 oz.; softsoap, 48 oz.; water, 100 gallons. We boil the pearlash and arsenic in a large iron boiler for an hour, then add the sulphur and softsoap, and thoroughly stir. When thoroughly mixed, add gradually to the water in the bath, constantly stirring. We have found this dip very effective, and it leaves the wool bright, clean, and beautifully soft. The poisonous dips require constant stirring, both before the sheep enter the bath and after each spell, of however short duration. It is not enough to trust to the sheep to do this stirring. An effective stirrer can be made by fastening a long, stout handle to the centre of a stout board about 12 in. x 10 in., and vigorously work this up and down from the surface to the bottom of the bath. Trouble is caused in many places by hard water: this can be overcome by the use of soda. But it does not matter how good the dipping compound is, if the dipping is not carried out thoroughly. It must not be rushed through. I have heard men boast of the number of sheep they have put through in an hour or day, being quite proud of the fact that they can do more than anyone else. These sheep are not dipped: they are only knocked about to no purpose. It is bad enough to have to knock the

sheep about at all, and, while at it, let the work be thoroughly done, and in time the tick and louse will be, like the scab, a thing of the past."

Considerable discussion ensued. The Chairman said he had had considerable experience in the dipping of sheep, and was quite satisfied that it was necessary and profitable. He did not consider the long bath advocated by the writer necessary; 30 feet in length was sufficient. He would have the best self-acting tipboard at the entrance. Mr. Fisher agreed. He asked why they should not dip always off the shears. Mr. Feuerherdt, in reply, said sheep were worried quite enough at shearing without dipping, and he would only dip off shears when necessary. The cost of materials for the dip he used came to £3 15s. for about 5,000 to 6,000 sheep. Stock Inspector Williams said that, whatever the conditions elsewhere, south of Bordertown it was no use using any but the poisonous dips. These protected the sheep against vermin for several months. Mr. Campbell suggested the building of dips on the co-operative principle, instead of each farmer making his own. They had two such dips in Millicent district. Mr. Pick said he had used most of the proprietary dips, but was now using one made of arsenic, soda, and soap. This cost about a sixth of some of those used. The proportions were: 1 oz. each arsenic and soda, dissolved in 4 galls. of water; about 6 bars of common soap were added to 200 galls. water.

DAIRYING.

Mr. P. H. Suter gave a short address on "Dairying." He dealt with the necessity for co-operation, and the results achieved by co-operative effort in various countries. The main points to be considered in successful dairying were breeding, feeding, water supply, cleanliness, and comfort of stock. The average cow in this State was a poor milker; but by judicious breeding and selection the yield of the herd could be greatly improved. Sufficient attention was not given to the provision of food for the dairy cows. Ensilage was specially advocated, and the speaker advised dairymen to grow sorghum, maize, oats, and other crops specially for ensilage. The overground tubsilo, which would hold 100 tons of ensilage, and which cost £25 to construct, was described. The necessity for cleanliness in milking, and care of the cream, frequent delivery of milk or cream to the factory, the feeding of calves, etc., were also dealt with. A short discussion followed.

NEXT CONFERENCE.

It was unanimously decided that the next Conference be held at Kingston.

SOME ESSENTIALS TO SUCCESSFUL FRUIT CULTURE.

Mr. Geo. Quinn (Horticultural Instructor) addressed the Conference on the above subject, and explained that he recognised he was speaking to farmers, and not gardeners. In consequence of this, he wished to treat the subject from an elementary standpoint, because, as he travelled about the country and saw fruit trees planted under very unsuitable conditions, and subjected to either neglect or mistaken methods of treatment, he wondered if their owners were fully alive to the needs of the trees. When the forms and functions of the various parts of a flowering plant were dealt with in botanical books, usually some small garden plant was used as a type. When the average man looked upon a fruit tree he was apt from such a superficial glance to assume that it was a very hardy thing, and did not need the attentions which ordinary garden plants required. He assured them this was not so, for while a fruit tree would withstand much greater neglect than some garden crops, still, to be brought to a high state of perfection and yield satisfactory results to its owner, the tree must receive treatment in keeping with its needs. He then briefly described the structure and functions of the leaves, stems, roots, and the root hairs common to fruit trees. The fact that all of the sustaining properties which the tree drew from the soil had to be taken in solution form through these tender distended cells, which project from the sides of the smaller roots, just behind their tips, was emphasised. Those were the real working pioneers of the root system, which sent out their feelers into the soil foraging for food. Tender and brittle as the unfolding leaves of the top, they required their surrounding media—the earth—to be in a suitable mechanical condition, if they were to make good progress in ramifying its bulk. Let growers examine these root hairs with a magnifying glass, and then ask if it were reasonable to expect trees to progress when planted in hard, compacted, un-aerated soils, or in positions where stagnant

water besoddened the soil around the roots, preventing the access of oxygen, so essential to the life of the roots, and the soil bacteria, or those free chemical activities which are always at work in earth's laboratory. The larger roots, which were so readily seen and generally regarded as the whole of the root system, were practically only conductors of the nutriment absorbed by the root hairs, and served as anchors, as it were, by which the tree was held in its position in the soil. Many persons in planting a young tree put its roots into a narrow hole, stamped the soil upon them, and then awaited results, which were usually of an unsatisfactory nature. In retentive soils such holes were equivalent to flower-pots from which the root-bound or stagnated plant could not be repotted. Better, in his opinion, to prepare the whole of the soil a foot or 15 inches deep than to dig holes 6 feet square and 3 feet deep for the reception of each tree. In a completely prepared orchard the roots ran freely through the soil, and secured not only a larger feeding area, but better anchorage. They also stood a better chance of escaping injury from stagnant water. In training the top of the tree the requirements of the foliage in the direction of securing an even distribution of sunlight and air must receive proper recognition. The distribution of sunlight was necessary, because to its action the free development of the green-coloured matter in the leaves—called chlorophyll—was due, and by its aid these green particles were enabled to utilise the carbon in the atmosphere to build up those woody parts which are made familiar to most in the form of charcoal in partly burnt wood. Leaves when densely crowded become pale, and but tardily carry out their duties as absorbers of gaseous food. Carbon was taken into the plant in combination with oxygen through small apertures in the leaves, and this usually took place more freely by the assistance of moist atmospheres. The necessity for spacing the branches, so that a fair measure of sunlight and air surrounds each leaf, would become apparent to anyone who looked at a tree from this point of view. The development of proper colour in the skins of the fruits, and the accumulation of flavours and sugars in them, also depend largely upon the offices performed by direct sunlight. Most diseases and pests lurk in the seclusion afforded by crowded trees, and in consequence good health and economic results are obtained by properly training the tops. The pruning applied to the tree other than the actual shaping was done to divert its energies into certain channels, to the partial suppression of others. A fruit tree was grown for its fruits, and, in economic fruit culture, the boundary of over-production of fruit, to the exclusion of much woody growth, was always perilously approached. When this process of stunting was carried sufficiently far, and fruitage predominated unduly over leafage, other processes of stimulation, such as feeding the roots and reducing the possibilities of fruiting by cutting away flower-buds during the winter, were resorted to. This enabled the balance of growth to be regained, and the tree to gather up further energy for a subsequent period of fruit production. In most parts of this State shelter against strong winds was necessary. If the natural contour of the ground provided such shelter, they could not have anything better, otherwise some living shelter belt was needed. Before planting shelters, he asked them to look around the neighbourhood and see if a local tree or shrub well suited to the prevailing conditions could be found. The Casuarinas or sheoaks and bullocks appeared to him to be worthy of a trial for this purpose, as in Nature they grew in the most exposed positions, and appeared to be more moderate in their demands upon the soil than many exotic trees now used as shelter belts around orchards. The annual tillage of the orchard was of the utmost importance, even after the original operations of preparing the soil had been faithfully followed. In most parts of South Australia he thought the great problem to deal with was the conservation of the moisture in the soil. In places in Victoria, where the yearly rainfall amounted to about 27 inches, the orchards were drained by tiles underground, and thus the root-feeding area was greatly increased. He recommended that people should cultivate the whole of the surface of the orchard, and not merely a space around each tree. Some people grew other crops between the trees; but he did not approve of that, as it took away moisture from the trees. The cultivation of the whole of the surface should be continued right through the summer, in order to conserve the moisture. Then they must feed their fruit trees also. Trees must exhaust the soil as rapidly, at any rate, as ordinary crops, and what was extracted from the soil in the way of fruit must eventually be returned to it in the form of manures. Looking at fruitgrowing from a domestic point of view, he said the first thing a man thought of when he began to grow fruit was to grow it for the use of his household. He must

not allow himself to be disheartened by failures. When he went in for it, let him select the best sorts and plant them. In many farm orchards they found old varieties, some of which would not sell now. It was of little use to have fine fruits that were not saleable, because, after the wants of the house were supplied, the rest must be given to the pigs. But he could select varieties—plums, for example—that would make good jams, preserves, and dried fruits. A man who grew plums should be able to supply himself with them all the year through in one of these forms. He thought the home garden had been much neglected by the rural population of Australia: but he contended that the establishment of a garden round a house went far to make it a home. He remembered seeing in a work on the making of gardens two pictures. One showed a residence, with scarcely anything around it, and no trees or shrubs. Below it were the words: "A house." On the other page was pictured a residence, surrounded by a plantation of trees, growing luxuriantly, and it was called "A home." He was very much impressed by that. Making the home and its surroundings pleasant and attractive would do much to keep the young men of the family on the farm, and from running into the towns to become policemen, railway porters, etc. With regard to commercial fruitgrowing, he did not feel so much at home that afternoon, as most of the fruit-sellers who were present had gone. In the present day commercial fruit-culture was specialised, and in entering upon it one needed to be posted up, not only in the qualities and varieties of fruits, but also as to the markets, and whether the favourite fruits would grow well in the locality. It was important to know what was going to take in the market. Some men watched the markets, and took advantage of any new variety of fruit that came out that was popular and valuable, and they succeeded. As far as the export trade was concerned, it was very little good growing a fruit that would not take in the European market. They had found out what was liked in Europe, and what could be grown here, and they were now trying to grow that article. They must watch the European market keenly, and notice what was in fashion. They must keep abreast of the times, not only in the production of the article in demand, but in keeping up the quantity and quality of it. There was a personality in all businesses; and it seemed to him that in fruitgrowing personality was a great point. He could tell them how to grow fruit, but he could not make them successful business men. They would notice a lot of land cut up somewhere for fruitgrowing, and settled as a fruit colony. One man would be seen to go ahead from the very start. Why? It was simply the personality, the adaptability, of the man that put him forward in that way. If a man had not the power within himself to develop, he would never reach the top in his business.

THE NEED OF A POLICY TO FOSTER AGRICULTURE.

Mr. R. Caldwell read a paper on "The Need of a Policy to Foster Agriculture" to the following effect:—"Whatever views we may entertain with regard to what does or does not constitute State socialism, we cannot shut our eyes to the fact that the Governments of all civilised countries at the present time are doing something to foster the progress of agriculture. Soil and climate are, without question, controlling conditions of no mean importance; but there is no denying the fact that, even where there are not particularly favourable conditions, satisfactory results have been obtained. When an enquiry is made, it will be seen that success is always due to the operation of certain causes. As Shakespeare says: 'There is a tide in the affairs of men, which, taken at the flood, leads on to fortune.' On land, as on sea, certain conditions must be observed if we desire to succeed in our undertakings. Knowledge of the right soil is indispensable. If we desire to become and remain productive competitors in the world's markets, we must be able to do as others are doing. It is not to be expected that people who know nothing about what is being done elsewhere can understand what is the most profitable line of policy to pursue in order to secure the best results from a given line of industry. The right sort of knowledge can only be gained by experience, and where the many are working this knowledge is more likely to be gained than in the small settlement. It is, therefore, desirable that our producers should be put in possession of the most reliable and up-to-date information, and this can only be obtained by people seeing what others are doing, or having the knowledge brought to them by the special instructor, or by means of object-lessons. In this connection a model farm, whether in the hands of a private individual or the State, could be made to serve an important purpose. I have sometimes thought that it

would be creditable to the Government, and highly beneficial to the producers, if a few practical and observant men were sent to other countries from time to time to enquire into the methods that were there adopted, with the view of bringing back knowledge that could be made of great assistance to their fellow-countrymen. Care would need to be taken to secure the selection of those whose services would justify the expenditure. From a national point of view the expenditure could be made to prove a splendid investment. Of course, a good purpose has been served by bringing in experts who have gained knowledge and accumulated experience in other countries. At the same time, a better purpose would be served by sending those who were thoroughly familiar with the characteristics of soil, climate, and mode of husbandry that obtain here to observe the methods adopted by the cultivators of similar produce in other countries. Now, the advancement of agriculture has received a little attention of late years by our Governments, but the policy adopted hitherto has been of a fragmentary character. It has been a sort of go-as-you-please. It has lacked a systematic, to say nothing of a scientific, basis, and clear lines of procedure. It has had neither beginning, middle, nor end. It has had a sort of vague existence—something like the Council of Agriculture, whose duties it would need an expert of no mean order to define. To stimulate and assist progress—if the State is to interfere at all—it is absolutely necessary that we should have a vigilant and well-qualified executive. There must be no remissness in attention, no clashing in duties, no uncertainty regarding procedure, but clear knowledge of official intentions, and that determination and assurance that properly arranged business can only give. If Government does anything, it ought to be done in the most systematic manner. Now, the question is: What should Government do? Well, as we have a Department of Agriculture, clear working lines should be drawn. The Secretary should be a person well grounded in the practice and theory of agriculture, and it should be his duty to see that the policy of the Department is given effect to. The State should be mapped out in districts, and representatives should constitute a Board of Agriculture, to advise the Minister, and take such action as would tend to the improvement of existing methods. Arrangements should be made for holding conferences in each of the districts at least once during the year—somewhat as at present—and for this purpose the Agricultural Bureau should be organised and classified into groups. Arrangements should be made for the delivering of lectures at stated times in each of the districts. Four lectures at least should be given from a central position in each group, at that time of the year when special knowledge would be most in demand. The general expenditure would need to be limited; but within the limit the Department should be given a free hand. It should be armed with full executive power. Of course, this programme is capable of improvement; but it serves to indicate the line of policy that might be adopted to give the producers the benefit of information collected from a wider surface and more varied experience than they can be expected to command themselves. The idea is to bring within their reach and make available information that will enable them to turn the resources of our country to better account, and help them to do their work in a more satisfactory manner, and earn an honest livelihood with less difficulty during the struggle for existence that producers in all parts of the world are bound to engage in."

Owing to the length of the programme there was no discussion on the paper, but Professor Angus, in a few remarks, expressed his appreciation of the main purpose of the writer, and said that with many of the suggestions he was in accord. Mr. Caldwell had suggested that the Agricultural Bureau system should be improved, but he did not indicate in what way. So far as the policy of the Department was concerned, he hoped to be able to tell them shortly that a definite programme had been worked out.

WOOL-CLASSING AND SHEEP-BREEDING.

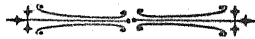
Mr. Geo. Jeffrey gave a short address on this subject. In classing wool they had to bear in mind the fact that different types of fabrics were made from different types of wool, and that even wool from different parts of the same sheep were utilised for different purposes. The classer, therefore, had to bear in mind when doing his work the various types and qualities of wool in a single sheep and the various textiles and fabrics manufactured and therefore the woolgrowers would see the necessity of keeping the different qualities of wool apart, in order to stimulate competition among the buyers. He would also remind them that there was another important factor in wool.

classing, and that was that the various types of wool on one sheep had a totally different value. For instance, the fleece might bring 1s. per lb., the pieces 6d., and the locks only 3d. or 4d., so that it would not at all pay to have them all together, or to have them indifferently separated. The various types must be separated with skill and the utmost care. It was difficult to lay down hard-and-fast rules in wool-classing; they had to carefully note the circumstances. They should bear in mind that there could be over-classing. Large buyers preferred to buy certain quantities, and if the clip were made into too many classes it might limit the competition. For small lots there was less competition. He would strongly advise small men to see that they had not too many classes. The woolgrower should also be careful in seeing that his sheep were shorn well. They should be shorn with the first blow, for second cuts appreciably reduced the price of a clip. They should skirt carefully, but not too deeply. See that the fleece was rolled carefully and neatly, for first impressions went a long way with a woolbuyer. Extra heavy and very coarse and discoloured fleeces should be kept separate. If a buyer saw a bad fleece among good fleeces it created a bad impression, and probably the price of the whole parcel was reduced. In this district they had an extremely high class of Merino sheep. Their district was specially favoured in this respect, when they could take sheep to Melbourne and win champion prizes. He would, however, advise young farmers not to buy sheep from flocks simply because the clip brought high prices. That the wool of a flock brought 17d. in the market was no criterion that they were the most profitable sheep. They might have a light wool, and they would get quality at the expense of weight. It would be better for them to keep sheep which gave a good-weight clip of medium quality. Light-weight sheep were of little use to the farmer. If they bred, they should select from a good flock which gave fair returns all round. The light and bright-woolled sheep were not profitable. If they went in for lambs for export, he advised them to use as sires the Dorset-Horn and Shropshire with Merino ewes.

LANTERN LECTURE.

Mr. P. H. Suter showed a number of views of dairy cattle, up-to-date appliances, factories, tub-silo, etc., and gave an interesting description of the principal points of each.

During the evening vocal and instrumental music was provided by local residents; and votes of thanks to the visitors, to the Chairman and Hon. Secretary of the local Branch, and to those who had assisted, brought a very successful gathering to a close.



AGRICULTURAL BUREAU REPORTS. *

Wandearah, March 20.

PRESENT.—Messrs. Munday (chair), Wall, Davidson, Dick, Birks, E. H. and E. J. Eagle (Hon. Sec.).

PORT PIRIE CONFERENCE.—The Chairman reported at length on proceedings of this Conference.

CATTLE COMPLAINT.—Members reported that a considerable number of cattle had died recently throughout the district. One farmer lost ten cows in three months out of a herd of fifteen. The appearance of the organs of the dead animals varied considerably, and members were inclined to agree with Veterinary Surgeon Desmond that dry bible was only one effect and not the cause of the trouble. With some animals the bible appears all right, but the lungs are affected. One member thought that inferior food was at the bottom of the trouble, but it was pointed out that one of the farmers who had lost a number of cows fed his stock on bran and good hay chaff.

Wepowie, March 24.

PRESENT.—Messrs. Hanna (chair), Gale, Smith, McNamara, Bishop, Orrock, Chrystal, and Halliday (Hon. Sec.), and two visitors.

SHOEING HORSES.—Mr. E. Smith read a paper on this subject. Nature provided the horse's foot with sufficient protection for natural conditions, but as man used him on hard land and metalled roads he must provide artificial protection in the form of shoes. The kind and shape of shoe, size and weight, will depend upon various circumstances, but in shoeing the horse care should be taken to interfere as little as possible with the natural protection. The shoe should be made to fit the hoof, and should be full size. It was better for it to be a little too large than too small. The farm horse in this district was free from many ills that exist in other localities, such as sand cracks, corns, etc. This was owing to the fact that they only required to be shod to prevent their becoming tender-footed from the heat of the ground, and in parts on account of the stony nature of the country. In shoeing their horses he advised cutting the hoof level, then fitting the shoe, taking care that it is quite level and straight. With the smooth side of the rasp remove a little of the hoof at the heel—not more than the thickness of ordinary paper. Then drive in the nails, but not too high; three-quarters of an inch was quite sufficient. Draw the nails down with the pincers, rasp away the piece of hoof drawn down by the nail, and clench. Remove any portion of the hoof that may stand over the shoe, but do not touch it anywhere else with the rasp. Members generally agreed with the paper.

Utera Plains, March 18.

PRESENT.—Messrs. Jacobs (chair), Barritt, Gale, Hale, West, Guidera, Ramsey, Deer, Venning, and a number of visitors.

THE WEATHER.—Mr. Willett read a paper dealing with the changes in the weather, and quoted from an article on forecasting the weather. Music and singing were indulged in, and an enjoyable evening spent.

Kanmantoo, March 17.

PRESENT.—Messrs. Lehmann (chair), Lewis, Mills, Hair, R. and J. Downing (Hon. Sec.).

CATTLE COMPLAINT.—Some discussion on this subject took place. Members who had made careful examinations of the carcasses of animals that had died from the complaint agreed with Veterinary Surgeon Desmond that dry bible was one of the effects, and not the cause, of the trouble. Some members thought some deficiency in the food was the cause, as they had noticed that

before showing any outward symptoms of the disease the animals would be found chewing bones, dead rabbits, old shoes, and other substances. A large number of cattle have died this year in this district.

THE WORLD'S RAINFALL.—Mr. Lewis read a paper on this subject, quoting the rainfall of various well-known districts of the old country, and also the extreme records in different parts of the world.

Calca, March 25.

PRESENT.—Messrs. Plush (chair), Bowman, Wilcott, Thomas, and Newbold (Hon. Sec.), and three visitors.

RABBITS.—Discussion took place on the best method of poisoning rabbits. Mr. Bowman favoured the use of jam poisoned with strychnine; phosphorised pollard was doubtless best for large runs, but was too dangerous on small holdings. Mr. Wilcott found strychnine and jam very effective, but thought phosphorised pollard cheaper and quicker. Mr. Newbold found the phosphorised pollard very effective, but care must be taken in laying it. He had lost 100 sheep since December from phosphorus poisoning. The baits should not be laid on or around the burrows or alongside the fences. Hot water should be used when mixing the dissolved phosphorus with the pollard; bisulphide of carbon should be used to dissolve the poison. Members were agreed that the safest way was to plough a furrow, place the baits in it, and after sufficient time has elapsed for the baits to do their work, plough the furrow in.

Gladstone, April 1.

PRESENT.—Messrs. Gallasch (chair), Rundle, Goodes, Inglis, Burton, Cook, Brayley, and Wornum (Hon. Sec.).

PICKLING WHEAT.—Most of the members favoured pickling the seed on the floor, as there was a better opportunity of wetting all the seed with a pickle of uniform strength. It was admitted that dipping the seed was probably the quicker method.

BURNING STUBBLES.—Several members advocated this practice, and it was suggested that it was open to question whether it would not pay to burn in order to destroy weed seeds, and so be able to crop the land more frequently.

MANAGEMENT OF SHEEP.—Mr. Brayley read a paper on this subject. Rightly managed, sheep were very profitable on the farm, providing meat for the house, assisting to keep the farm clean, and bringing in substantial returns from wool and lambs. Care must be taken not to overstock; it was better to err on the other side. The farmer should be very careful that he starts on right lines. The matter of the breed will depend upon the main object in view, but the best of its kind within the reach of the farmer should be obtained. Whether wool or lambs are the main object, the Merino will be the best for the foundation stock. For wool keep the pure Merino, and for lambs cross with some of the larger breeds. To keep up and improve the standard of the flock constant culling must be resorted to. This is best done at shearing time, when all the old and inferior stock should be culled out. To secure the best results the sheep must have a plentiful supply of feed and water, especially the latter when on the stubbles. They will do better if they can go to water whenever they want it, and the quieter they can be left the better. Sheep that have to be driven to water do not do so well, besides which the fleece gets dirtier. Sheep that are made to do the work of the scarifier on the stubbles cannot grow such clean wool as otherwise. With care they can, however, be made to materially assist in keeping down the weeds and still carry a good average clean fleece. Mr. Brayley illustrated his remarks with samples of wools. Cleaning the fallow and rearing fat lambs do not go together under average conditions. The ewes and lambs must be provided with plenty of food in order that the latter may be in the best of condition for marketing. Where lucerne can be grown it is unequalled for lamb-rearing. Shearing should be finished before the grass seeds, etc., were likely to get into the wool. Too much classing should not be attempted with small flocks. Just take off the belly wool, then remove all the dirty edges and stained or discoloured parts. In putting up the wool it was sufficient to class it as fleece, lambs, bellies, pieces, and locks. An interesting discussion followed, members generally agreeing with the paper.

Petina Well, March 25.

PRESENT—Messrs. W. Penna (chair), R. and A. Penna, Norton, Bayton, and Fiddamann (Hon. Sec.), and two visitors.

ROADS.—Mr. C. Giles forwarded a paper dealing with the difficulties experienced by the farmers in carting their produce to market, on account of the bad condition of the roads.

STRYCHNINE FOR POISONING RABBITS.—In reply to enquiry as to best means of dissolving strychnine for poisoning pollard, members used vinegar. They recommended mixing the strychnine with jam instead of with pollard, using as much poison as will lay on a shilling to 2 lb. of jam.

DRAYS V. WAGONS FOR WHEAT CARTING.—This subject was discussed at some length, most of the members preferring the dray to the wagon. Three horses harnessed abreast was favoured, as one two outriggers took the sway off the shafter. The respective merits of broad and narrow tires were referred to.

Woodside, March 27.

PRESENT—Messrs. Caldwell (chair), Lauterbach, Drogenmuller, Keddie, Hutchens, Fowler, Kleinschmidt, W. and H. Rollbusch, and Hughes (Hon. Sec.).

ENSILAGE.—The Hon. Secretary read a short paper on "A Few Reasons Why Farmers Don't Make Ensilage and a Few Reasons Why They Should." Ten or twelve years ago there were a dozen or more farmers in this district making ensilage, where to-day there was only one or two. Why was this? Because the ensilage they made, instead of being a first-class food, was almost worthless, either being rotten and stinking, or dry, like poor, mouldy hay. The crop was either let get too dry before it was carted to the stack or pit, or not enough weight put on to the material when it was there. Nearly all the articles you read on making ensilage advise letting the crop lie for a time to wilt or dry a little before carting; also when stacked, to let it stand for a few days without the weight on, to let the temperature rise to a certain height. Both were great mistakes, and two of the principal reasons why making ensilage is not the success it should be. The crop must be carted as soon as possible, more especially if it be oats, wheat, or barley, or anything with a hollow stem. The more clover, lucerne, dandelion, or anything with a solid stem, the better the ensilage will be; in fact, it is almost impossible to make a good ensilage with wheat or oats by themselves. The weight should be put on as soon as they finished carting, or the temperature will soon be too high, and it will take more weight than they would care to put on to lower it. The ensilage when open for use will be found to be a very dark brown colour, with little moisture in, and instead of being a first-class feed will be almost worthless. Another objection to the making of ensilage was the labour attached to the weighing of it, but if they got a good silage it was worth all the trouble. One of the principal reasons why they should make it was it was such a splendid change for cows when everything else was so dry; it kept them healthy and in good condition at a small cost. What would make poor hay would make good ensilage, and they could cut the crop in time to plough the land for summer crops such as maize or millet, and by doing the same keep the land free from weeds. If there was more ensilage in the district this dry year they would not hear of so many dairy cows dying of an unknown disease. Mr. Hutchens said he always made some ensilage, and found it the best feed he could give the cows at this time of the year to keep up the milk supply.

Bute, March 21.

PRESENT—Messrs. A. Schroeter (chair), H. Schroeter, Barnes, Commons, Stevens, Hamdorf, Sharman, and McCormack (Hon. Sec.).

SHEEP COMPLAINT.—Mr. Commons reported that a number of his sheep were suffering from some complaint. At first a pink or red film appeared over the eye; this gradually spread and thickened until the animal was quite blind. The eyes then seemed to burst, and the sheep soon died. He had lost 15 head, and 10 others were affected. Messrs. Schroeter stated that the first symptoms were similar to a trouble that affected nearly the whole of their flock some years ago, but they did not lose any animals.

Davenport, March 16.

PRESENT—Messrs. Trembath (chair), Roberts, Holdsworth, and Lecky (Hon. Sec.), and nine visitors.

RABBITS.—Mr. F. B. Rathbone gave an interesting address on "The Rabbit: A Pest or a Food." He first referred to the rabbit in other countries, its habits, and its introduction to Australia. The habits of the rabbit in Australia are too well known to need dwelling on; they have proved their adaptability to all sorts of climates and conditions, and it is only a question of time when the rabbit will be found throughout the entire continent. They are steadily pushing their way north and west; in Queensland, South Australia, Victoria, and New South Wales they are already in possession, and in Western Australia they are to be found in increasing numbers, and, in spite of fences and other devices, are still advancing. He thought it a conservative estimate to say that their feeding capacity was equal to that of half of their domestic stock. He was certain that the late drought, had as it was, would have been far easier to tide over had there been no rabbits. It is in the destruction of fodder bushes, which have formed so great a stand-by in former dry years, that the serious nature of the matter lies. In this district, although the past two years have had a fair rainfall, on places where there has been no stock whatever the country is quite bare. He had fenced a small paddock, in no way differing from the surrounding country, on which there is a good growth of bushes and grass; whilst outside, where there had been no stock, but the rabbits have had access, it is quite destitute of feed. From what he saw recently on the Murray, which country he was well acquainted with before the coming of the rabbit, he was convinced that unless some feasible plan could be formulated to keep the animal in due bounds the whole of pastoral Australia will steadily deteriorate, and never carry the stock it did in its original condition, whatever the seasons may be. The annual loss in value of stock and wages paid in destruction must at least be one million sterling. Were this fact thoroughly grasped by the people of Australia it would be seen to be of more consequence than anything else that now occupies the attention of their legislators. The question resolves itself into two issues, viz., should the rabbit be considered a pest to be ruthlessly exterminated, or can it be regarded as a food which should be profitably utilised. Personally, he did not believe it would ever be possible to exterminate them. The present methods of destruction simply thin them out, but leave enough to multiply. It is now proposed to introduce some disease, but although he had not sufficient scientific knowledge to pronounce on the matter, he had the gravest doubts as to the wisdom of such a proceeding. It may be that experiments conducted in France may give a different result here owing to climatic and other causes, and if it is determined to conduct such experiments here they should take place on various islands off the coast till the certainty that any such disease cannot be communicated to either stock or human beings is proved. If such experiments are successful, it must be borne in mind that the export trade in tinned and frozen rabbits must at once cease, and a certain amount of revenue be foregone till other sources of supply take its place. It is contended by some that, as the rabbit is a source of employment to many engaged in trapping and skinning, the presence of them is not all evil; but, on this reasoning, a plague can be also said to have its redeeming features from the employment it furnishes to undertakers, medical men, and chemists. The broad fact must remain that had they the proportionate number of stock now shouldered out by the rabbit there would have been more employment and distribution of money. If he spent £100 in destroying rabbits, the men employed certainly receive and spend that amount, but his income and consequent spending power is reduced by that amount. If he spent the same amount in fencing, dam-sinking, or other improvements, to enable him to recoup himself by a greater return for increased stock carried, that amount is a clear gain to the community as a whole. Even where the rabbits are frozen or canned the ultimate return was not so good as it would be from either pastoral or agricultural products. Therefore, he unhesitatingly said that if by an expenditure of even ten millions they could exterminate the rabbit it would be a sound investment; but he was afraid it was impracticable. Their best policy was, therefore, to see if they could not make a profit from them. At present, outside railway or handy carriage, the only remedy was to adopt the best systems of poisoning or killing the vermin. In the settled districts, however, they may be utilised to a far greater extent than is done at present. The system of tinning now in vogue was capable of great improvement, and especially in the direction of cleanliness; the freezing business must also be conducted with

a view to the prevention of forwarding thin and small specimens, and a greater regard to landing in a sound condition. There was a third method which holds out greater hope than either of the others, and that is by preparing from the rabbit a white extract of meat for general use. If it can be proved that factories can be established at various centres, and rabbits bought at 2d. apiece, there was a possible solution of the problem; and at present it does not pay to forward rabbits any great distance either for tinning or freezing, but provided branch factories for extract of meat can be established at comparatively small cost, they could be started all over the country. This meant that they adopted the rabbit as part of their agricultural and pastoral programme; and, provided it paid to do so, he did not see that it mattered. If this is not feasible the only alternative was to introduce a new tax on land for the purpose of combatting one evil; and to make it effectual he would remit half of it to those whose land is free or kept clean, whilst those who do nothing should pay the full amount; the onus of proving that his land is free to be borne by the owner or occupier, and a certificate issued remitting the half tax for that one year. This, no doubt, has its objectionable side, but the present position is simply intolerable. The Vermin Act is a dead letter, and many District Councils do nothing whatever to clear the pest on the lands under their control. The consequence is that the man who tries to keep his land clear is simply affording a better feeding ground for his neighbour's rabbits. Wire-netting is only a check, not an effectual barrier, and unless there is one general concerted plan throughout Australia, with modifications for certain districts, the rabbit will continue to spread and increase, and the few who do take action will be bearing the brunt of what should be a national undertaking. Considerable discussion ensued, and a hearty vote of thanks was accorded to Mr. Rathbone.

Gawler, March 17.

PRESENT—MESSRS. H. Roediger (chair), F. Roediger, Hillier, Kreig, Badcock, and Leak (Hon. Sec.), and one visitor.

FORMALIN.—The Chairman reported on experiments with formalin for pickling seed wheat, as under:—Four hundred good, sound grains of wheat were selected and divided into eight lots of 50 each, with the following result:—

No. of Plot.	Treatment.	No. of Plants.
1	Seed Pickled with $\frac{1}{2}$ oz. Formalin to 1 gall. of water, 8 days before sowing	27
2	Seed Pickled with $\frac{1}{2}$ oz. Formalin to 1 gall. of water, 5 days before sowing	32
3	Seed Pickled with $\frac{1}{2}$ oz. Formalin to 1 gall. of water, 3 days before sowing	26
4	Seed Pickled with $\frac{1}{2}$ oz. Formalin to 1 gall. of water, 12 hours before sowing	36
5	Seed Pickled with $\frac{1}{2}$ oz. Formalin in 1 gall. of water, 12 hours before sowing	35
6	Seed Pickled in Bluestone Solution ($\frac{1}{2}$ lb. to $1\frac{1}{2}$ gall. of water), 12 hours before sowing	41
7	Seed Pickled in Bluestone Solution ($\frac{1}{2}$ lb. to $1\frac{1}{2}$ gall. of water), 12 hours before sowing	44
8	Unpickled	45

To ensure germination irrigation was resorted to. Mr. Roediger stated that he intended to repeat the experiments when the ground was naturally moist enough to cause germination.

HORSE DENTISTRY.—Some discussion took place on the treatment of horses' teeth. Members thought that caution should be exercised by farmers in this matter. Some had found their horses' teeth injured by the treatment, but it was agreed that long points should be removed to facilitate mastication.

Penong, March 18.

PRESENT—Messrs. Oats (chair), Weber, Brooks, Williams, Farrelly, and Wiseman (Hon. Sec.), and three visitors.

CATTLE COMPLAINT.—Mr. C. Williams read a paper on "Dry Bible." Losses in this district had been severe, and the treatment of this complaint was of great importance to the farmers. Fat cattle are taken ill suddenly, and die within a couple of days. Milking cows suffer most. In some cases the "bible" is hard and impacted; in others it is quite soft. He had seen some bodies in which the gall was very large, and the lungs appeared like clotted blood. He had been giving his cattle two feeds a day of bran, with a little bonemeal and copra cake, and rock salt and sulphate of iron in the water, but still experienced losses. Some discussion ensued. It was noted that while the outward symptoms of the trouble were very similar, the appearance of the organs of the body varied to a remarkable extent.

Koppio, March 16.

PRESENT—Messrs. Howard (chair), Swinburne, Jacobs, Roberts, Price, Richardson, Newell, and Brenndand (Hon. Sec.), and two visitors.

FODDER CROPS.—Mr. Richardson read extract dealing with the growing of sorghum on the fallows. One member advocated sowing peas instead, as they would enrich the soil for the succeeding wheat crop. The Chairman had found the common mallow a good food for stock, and promised to distribute seed for trial.

Meadows, March 21.

PRESENT—Messrs. Pearson (chair), Ellis, Griggs, Clatworthy, Brooks, Wright, and Stone (Hon. Sec.).

GREEN MANURING.—Mr. Pearson initiated a discussion on this subject. He spoke favourably of the benefit derived from the turning under of a green crop. Where peas, vetches, etc., were used as a green manure the results were very satisfactory. Buckwheat, rye, and other cereals could also be grown for this purpose.

Richman's Creek, March 20.

PRESENT—Messrs. Knauerhase (chair), J. M. and H. K. Kelly, J. and J. S. McSkimming, F. Lehmann, Knox, Nicholson, Donovan, and F. H. Lehmann (Hon. Sec.), and eight visitors.

DAIRYING.—Mr. J. M. Kelly read a paper on this subject. The dairying industry was of the greatest importance to this district, and to the State, and was capable of considerable development. To secure and extend their trade with oversea countries it was essential that the produce should be of high quality. Sound, wholesome fodder must be provided for their cattle, care should be given to the improvement of their herds, and thorough cleanliness observed throughout the dairy. The Chairman thought that of late years dairying had been more profitable than wheatgrowing. The returns were quicker and more regular. Mr. J. McSkimming was satisfied that if the cream or milk produced in this district was treated as it should be they could produce butter unsurpassed by any district in Australia. Mr. Nicholson thought that if the dairymen of Denmark had to go through such droughts and duststorms as sometimes experienced in this district they would not produce such uniformly high quality butter. Members expressed their appreciation of lecture given recently by the Dairy Instructor (Mr. P. H. Suter). Members were of opinion that Mr. Suter's visits to the farms was a move in the right direction.

PRICE OF WHEAT.—Mr. J. McSkimming initiated a discussion on better prices for wheat. He quoted figures to show that the export of wheat from the United States of America was rapidly falling away, and, with her increasing population, she would soon require all the wheat grown in the country. The population of other wheat-producing countries was also increasing, and he believed that the added demand for wheat would in the future result in

a more regular and remunerative price for that article. Most of the members agreed, though several pointed out that when wheat was high they had none to sell.

Mount Remarkable, March 21.

PRESENT—Messrs. Challenger (chair), Karger, Morrell, Yates, Oldland, and O'Connell (Hon. Sec.).

COST OF WHEATGROWING.—The Chairman considered Mr. Coleman's estimate in the March *Journal* too low. Sufficient was not allowed for cost of team, feed, breakages, and loss of time. No allowance appeared to be made for the feed of the team on Sundays and in wet weather, when they could not be worked. The cost of stripping was also under-estimated. He did not consider wheatgrowing paid except where the farmer and his family did most of the work. Mr. Karger thought that if they put in a smaller area and put it in well it would pay better.

Willunga, April 1.

PRESENT—Messrs. W. J. Binney (chair), J. Binney, Blacker, Valentine, Pengilly, Vandrey, Richards, Manning, Brown, and Hughes (Hon. Sec.).

COST OF WHEATGROWING.—This subject was well discussed, and it was resolved unanimously:—"That, with proper cultivation and in conjunction with other farm products, wheatgrowing will pay." The estimated cost per acre of cultivation in this district is set down as follows:—Ploughing, 6s.; cultivating before drilling, 4s.; drilling, 2s.; manure, 5s. 6d.; seed, 3s. 6d.; harrowing, 1s.; rolling, 1s. 6d.; reaping, 3s.; rent, 6s.; cleaning comes to 2d. per bushel, and bags, 6d. each. With fallow land it was not possible to furnish an estimate, as the work required is never alike in two seasons, while some soils require much more working than others.

Mannum, March 21.

PRESENT—Messrs. Faehrmann (chair), Haby, Schulze, Pfeiffer, Lahne, Walker, Lenger, and Preiss (Hon. Sec.); and one visitor.

COST OF WHEATGROWING.—This subject was discussed, the experience of members tending to show that wheatgrowing alone was unprofitable in this district, but in combination with sheep or dairy cattle a living could be made. The following estimate of the cost of growing an acre of wheat, on fallow, in this district was adopted:—Ploughing, 4s.; cultivating twice, 3s.; seed, 3s.; manure, 3s. 9d.; drilling and harrowing, 2s. 6d.; stripping, 4s.; winnowing (at 4d. per bag), 6d.; carting, 3s.; rent, rates, and taxes, 2s. 3d. or a total of 26s. per acre.

Narridy, March 25.

PRESENT—Messrs. Satchell (chair), Kelly, Flavel, Black, Freebairn, Smart, Turner, and Dunsford (Hon. Sec.).

HON. SECRETARY.—Mr. H. B. Turner was appointed Hon. Secretary, in place of Mr. Dunsford, who resigned and was accorded a vote of thanks for his services.

STRANGLES IN HORSES.—Mr. Turner thought something should be done by the authorities to prevent horses suffering from strangles watering at public troughs. Only recently he saw a horse with a very free discharge drinking at a trough where other horses were watering. This must be a serious factor in the spread of the disease. Members agreed with Mr. Turner, and thought the matter should be brought under the notice of the District Council.

Morphett Vale, March 21.

PRESENT—Messrs. Forsyth (chair), Cain, Hunt, J. and E. Perry, McLeod, O'Sullivan, and Anderson (Hon. Sec.).

COST OF WHEATGROWING.—Mr. Cain read a short paper on the cost of wheatgrowing on his farm, as under:—

	£	s.	d.
Two years' rent	0	15	0
Ploughing fallow and harrowing	0	7	6
Scarifying and harrowing (first time)	0	4	6
Rolling, scarifying, and harrowing	0	4	6
Drilling	0	2	0
Seed and manure	0	8	1½
Harrowing and rolling after drill	0	1	6
Reaping and cleaning	0	5	0
Rates and taxes	0	0	7½
Cartage of wheat to market (3d. per bushel)	0	4	0
	£2	12	9

The crop, at 16 bushels, would, at 3s. 4d. per bushel, be worth £2 13s. 4d. He allowed nothing for the straw, as in his opinion, it paid better to burn it than to cut and harvest it. By burning they destroyed a lot of vermin, weed seeds, etc. Several of the members agreed with Mr. Cain in this matter, but others preferred to plough under the straw. Mr. E. Perry thought that if farmers in the South, within reasonable distance of Adelaide, were to reap one-third of their crops for wheat, instead of cutting nearly all of it for hay, they would get an increased price for their hay, which would more than repay them.

RED WORMS IN HORSES.—Mr. J. Perry reported having treated horses similarly affected to those at Aldinga, in accordance with the recommendation of Veterinary Surgeon Desmond, with satisfactory results.

Rhine Villa, March 17.

PRESENT.—Messrs. G. A. Payne (chair), F. F. and H. W. Payne, Lewis, Mickan, Hecker, Pannach, W. T. and J. Vigar (Hon. Sec.), and one visitor.

FARM HORSES.—Mr. A. Lewis read a short paper on this subject. The best way for the farmer to keep up his team of horses was to breed one or two each year. To buy horses was not only more expensive, but there was always considerable risk that some of them would turn out "duffers." The farmer should secure the services of the best stallion available, as a little extra expense for the service would be amply repaid in the foal. He would advise occasionally mating the best mare on the farm with a good, strong, blood horse, as the progeny will prove the best of roadsters, and will fetch a good price if sold. The farm horse should not be too heavy; a thick-set, nuggety, active horse will do the best work on the farm, and will keep in condition on less feed than the very heavy horse. Members agreed that it paid best to breed their own horses. The Chairman said the main drawback was that they could get little work out of the mares while they were suckling the foals. The main point in rearing the foal was to feed it well and keep it growing. He found that foals that were well kept could be broken in a year earlier than those not looked after so well. Mr. F. Payne advised giving the in-foal mares steady work close up to foaling time, but shaft work must be avoided. A cross between a roadster mare and a draught stallion was recommended by two members as producing the best stock for farm work.

Hartley, March 17.

PRESENT.—Messrs. Wundersitz (chair), Reimers, Klenke, Kutzer, Pratt, and Brook (Hon. Sec.).

STANDARD BUSHEL.—Article by Mr. Summers on the f.a.q. standard was well discussed, and met with approval. Members considered the present a very one-sided system, all the advantage of a high-quality wheat going to the merchant. It was of no benefit to the farmer to produce a high standard sample, as he got no more for it, and was at extra expense in cleaning.

COST OF WHEATGROWING.—Discussion on Mr. Coleman's estimate took place. Members considered a number of the items too low. For ploughing, 5s. per acre was quite little enough. Harrowing should be 1s. per acre, and drilling 2s. 6d. If the team only covers 8 acres a day when scarifying 1s. 6d. per acre is too low. Cornsacks and twine cost equal to 2s. 6d. per acre last season, leaving nothing for labour of sewing and handling.

Mundoora, March 17.

PRESENT.—MESSRS. Harris (chair), Dick, Aitchison, Mitchell, Button, Haines, Arbon, and Mildren (Hon. Sec.).

RABBITS.—It was agreed that the most effective agent for destroying rabbits was phosphorised pollard. Mr. Mitchell stated that if the phosphorus was carefully dissolved in bisulphide of carbon there was absolutely no danger of fire being caused by the baits.

BAGS AS WHEAT.—Discussion on this subject took place. Although the merchants claimed that they paid 1d. per bushel more for wheat when buying it bags in than they would if bought at net weights members thought there was no evidence to prove that this was so, the merchants having the sellers entirely in their hands. Mr. Haines strongly condemned the present system, and wanted to know what the Farmers' Union—which was formed to protect the farmers' interests—was doing to adopt this practice.

WALLAROO PHOSPHATE WORKS.—Mr. Haines gave an interesting account of a recent visit to these works.

Clare, March 17.

PRESENT.—MESSRS. Christison (chair), Jarman, Kimber, Kelly, Pascoe, Stuart, and Dall (Hon. Sec.).

FRUIT AND FRUIT PRODUCERS.—Mr. W. Kelly read a paper on this subject. It would be readily admitted that the fruit industry in this State is but in its infancy; especially is this the case as regards the District of Stanley. Taking into consideration the fact that a section of the people who entered on this new enterprise possessed limited practical knowledge of requirements, the result of their labour is on the whole encouraging. They did not anticipate when they entered on fruit culture that their efforts in that direction were to be largely frustrated by a variety of pests, and they could hardly wonder, therefore, if some of the inexperienced fruitgrowers when having to face unexpected difficulties should feel at times inclined to abandon fruitgrowing altogether. That feeling was intensified when it was found that the codlin moth had invaded their orchards, and was doing immense damage to fruit. The aim of this paper was to encourage those who may be beginning to relax their energies to commence work with renewed vigour, and cope with difficulties as they may appear. Orchardists were indebted to the Inspector of Fruit (Mr. George Quinn) for the whole-hearted and intelligent manner in which he has dealt with the fruit pests, more especially the codlin moth. Growers who have practically carried out his instructions have benefited much by so doing, but some people are slow to grasp the truth. Those fruitgrowers who have sprayed the trees skilfully, attended to bandages regularly, and carefully gathered affected fruit find they are able to dispose of a large percentage of sound, clean, marketable fruit. But in orchards where little attention has been given to spraying the trees, where bandaging has been done by fits and starts, the pest has continued to thrive, the percentage of sound, clean fruit has not been so large. In several small gardens where little or no attention has been given to the trees the fruit has scarcely been worth gathering, and as a rule the growers who do little to keep their trees clean and healthy are those who proclaim that the remedies prescribed for destroying the pest are ineffectual. It is asserted by some that the decrease of codlin moth this season, and consequently the cleanliness of the fruit is due to the excessive heat of a few weeks ago. It would be readily admitted that the heat wave had a direct influence in lessening the pest; but it is also noticeable that the remedial means used in the spring and early summer had a marked effect on the early codlin broods. Seeing, then, that remedial means have been used with good results there is encouragement to the body of fruitgrowers to persevere in their work of exterminating their most dreaded foe. There are several forms of disease which cause anxiety to fruitgrowers. That which is known as "die back" was becoming rather prevalent in some of their orchards. The trees begin to decay from the tips of leading shoots. In winter the affected wood may be cut out, but decay continues till the tree dies. Various theories have been put forth as to the cause, but they could only point to the effect. It was thought that trees planted on limesone soil were more subject to "die back" than trees growing in other soils, but it has been proved that such is not the case. Though the cause of the disease may as yet be unknown, he thought he could

venture to state that a cure has been found, *i.e.*, cutting out the diseased wood in early summer, when the flow of sap is vigorous. The orchardist will soon find young healthy wood replacing the "die back" branches, and firm, healthy shoots from a foot to eighteen inches in length are the result of the season's growth. Should any portion of the "die back" branches be left at the first summer's pruning, they should be cut off the following summer, and a healthy, well-shaped tree will be the reward of such labour. A few years ago about a dozen "die back" trees in an orchard in the Stanley district presented a very sickly, unsightly appearance; now they are in a flourishing condition.

Nantawarra, March 20.

PRESENT—**MESSES.** R. Nicholls (chair), Sleep, Dixon, Pridham, Herbert, Dall, Bierwirth, and J. Nicholls (Hon. Sec.), and three visitors.

HARVESTING OPERATIONS AT ROSEWORTHY.—Professor Perkins's report in *The Journal of Agriculture* of results of harvesting operations at the College Farm were read, and an interesting discussion took place. Members thought that the cost of harvesting with the binder and thresher had been underestimated, and that the grain could be gathered more cheaply and expeditiously with the complete harvester or stripper. In regard to supply of food, members were of opinion that it would be better to cut a larger acreage for hay instead of depending upon the straw stack.

AGRICULTURE IN ENGLAND.—Mr. Sleep, who has just returned from a visit to England, gave an interesting account of various matters connected with agriculture.

Waikerie, March 18.

PRESENT—**MESSES.** Rowe (chair), Blizzard, Allen, Jones, Perry, Woods, Lewis, sen. and jun., Jaeschke, and Green (Hon. Sec.), and three visitors.

STANDARD BUSHEL.—Considerable discussion took place on article in March issue on the f.a.q. standard, by Mr. W. L. Summers. Members desire to place on record their appreciation of the article, which they consider a valuable contribution on this much-vexed question. Members heartily support the efforts of Mr. Teagle, of Kapinda Branch, to secure a legal standard of 60 lb.

RABBITS.—Members reported that owing to the great increase of rabbits throughout the district no crops could be grown outside a netting fence. Even the native shrubs and trees were being killed by the vermin. Phosphorised pollard was being used with good effect.

Reeves Plains, March 17.

PRESENT—**MESSES.** Folland (chair), Alexander, George, Arnold, Day, R. H. and W. Oliver, Richter, and McCord (Hon. Sec.).

FARMERS AND MIDDLEMEN.—At previous meeting Mr. J. C. Carroll read a paper on this subject. There was never a period in the history of the State when there was so much dissatisfaction amongst farmers over the selling of their produce as at present. The price paid to the farmer and the price paid by the consumer for the same article were so different that they could not shut their eyes to the fact that the merchant and middleman took too great a share of the value of the farmers' produce. They did not desire to abolish the middleman, but they desired a fairer deal from them than they were getting. The farmer had no voice whatever in fixing the price of his wheat. It mattered not whether the season was bounteous or the reverse: the merchant fixed the market price, and the farmer had usually to accept what was offered. The farmers should endeavour to secure protection against the actions of rings and monopolies. They had to pay duty on most things they required, but they got no benefit in this direction in the disposal of their produce. Mr. George said there must be some one between the farmer and the manufacturer. The Farmers' Co-operative Union was started for the benefit of the producer, but he could not see that it gave the farmer a better deal than the merchant did. Mr. W. Day did not agree with much that was said about the

farmer. If all they read was true, one could not help forming the opinion that the farmers as a body were very dense and at the mercy of every one. Such, however, was very far from being the case. Taken altogether, in this and surrounding districts, the farmer was in a very sound position. He was usually up-to-date in his operations, kept himself acquainted with the conditions of the market, and was holding his own well. Members generally agreed that it was absurd to talk about doing away with the merchant or middleman, but they thought that in many instances they took too great a proportion of the profits of the farmers' work.

BINDER V. HEADER.—Members were unanimously of opinion that the complete harvester was the cheapest machine to take off the grain. The binder and header entailed too much labour.

Port Pirie, March 21.

PRESENT—MESSRS. Smith (chair), Jose, Holman, Bell, Crispin, Johns, Wright, Hector, Spain, Hannaford, Humphris, and Wilson (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—Members met at residence of Mr. E. J. Hector, and spent some time in examining the surroundings. Mr. Hector has a fair area under lucerne, which can be flooded in the winter, and produces a heavy crop. The orchard and vineyard are also irrigated in this way, with satisfactory results.

VISIT TO NEW SOUTH WALES.—Mr. Hector read an interesting account of a recent visit to Young (N.S.W.) district.

Hawker, March 21.

PRESENT—MESSRS. Wardle (chair), Hirsch, O'Loughlin, Schuppan, Moller, Iredell, and Smith (Hon. Sec.).

FORMALIN.—Some discussion took place on the use of formalin. Members wished to have particulars as to:—1. Method of pickling. 2. Whether one seed will be injured if bagged for some days after pickling. 3. Whether the pickled grain would be poisonous to poultry. [Add 1 lb. of Schering's 40 per cent. formalin to 40 gallons of cold water, rain water for preference. The wheat can be pickled on the floor, taking care that every grain is thoroughly moistened, or by dipping for five minutes in cask. It is reported that where the pickled grain is not sown for several days injury results, but we cannot find any record of accurate tests on this point. Formalin is poisonous, and at the strength used it is most probable that if poultry got at the pickled grain it would have an injurious effect on them.—Ed.]

SEEDSOWER CRACKING GRAIN.—Mr. Schuppan said that for a long while he had been of opinion that the ordinary seedsower cracked a considerable proportion of the grain. To ascertain whether this was so he caught a sample as it came from the sower. This he tabled, and was found to be badly cracked. He advised farmers to test for themselves the extent to which their sowers cracked the grain.

Port Elliot, March 18.

PRESENT—MESSRS. W. E. Hargreaves (chair), Pannel, Green, Nosworthy, McLeod, Gosden, H. and H. B. Welch, and W. W. Hargreaves (Hon. Sec.).

THE AGRICULTURAL BUREAU.—The Chairman read a paper on a plea for the Bureau and Congress work.

COST OF WHEATGROWING.—Mr. Coleman's article in the March issue of *The Journal* was discussed at length. Members considered the estimate for drilling and manure too low, and pointed out that no allowance was made for cost of pickling wheat, for loss of time in wet weather, carting to paddocks and to market, rolling land, etc. Such items as cost of ploughshares would vary according to the nature of the land.

PICKLING SEED WHEAT.—Mr. Gosden advocated pickling wheat a month before it was sown, as in his opinion the seed came up better than if sown immediately after pickling. He also stated that he found the early crops benefited more than did the late sown from the application of manures.

Lipson, March 18.

PRESENT—Messrs. Potter (chair), Provis, Thorpe, Brown, Bratten, France, Brongham, and Barraud (Hon. Sec.), and two visitors.

COST OF WHEATGROWING.—The Hon. Secretary initiated discussion on this subject, criticising published estimates. In his opinion, in this district it took, at present prices, six to seven bushels per acre to cover the actual cost of production, apart from rent or interest on capital value of the land. Mr. Bratten also dealt with this matter. Some discussion took place on experiments with different varieties of wheat.

Lyndoch, April 14.

PRESENT—Messrs. Kennedy (chair), Ross, Schenke, Warren, Woolcock, Mitchell, Burge, Kluge, Wolff, Zimmermann, H. and E. Springbett (Hon. Sec.), and two visitors.

SPRAYING APPLES.—Mr. Mitchell stated that he commenced spraying for codlin moth when the apples were quite small, and repeated the operation every fortnight until the middle of February, with good results. He thought, however, he would have done better had he given the later sorts another spraying. Mr. Woolcock sprayed his trees five times, with satisfactory results. He hoped that in the near future he would be able to dispense with spraying operations, as he found a codlin moth parasite at work in his garden. Most members agreed that the Bordeaux mixture properly applied was a preventive of shothole in apricots and scab in pears.

COLIC IN HORSES.—Mr. F. Warren read a paper describing the treatment given to three horses. The first case was that of a neighbour's. The horse was driven home hard during the rain, and left tied up until the rain stopped. She was sweating freely when taken out of harness, and allowed to have a long drink before being fed and turned out for the night. Next morning she was lying about, being disinclined to move, but towards evening she appeared better. Next morning, however, he was asked to go over and see her, as she was down, with abdomen extended to such an extent that he thought that it would be necessary to puncture it to let the gas escape. The head and tail were stretched straight out, pulse normal, breathing hard and catchy, and when in pain she sobbed like a child. Thinking the trouble was partly due to stoppage of the water he administered a drench of 1½ oz. sweet spirits of nitre in 1½ pints linseed oil, then back-raked her, and hand-rubbed her well. This seemed to ease her, but as she was still distended badly he gave a drench of 2 oz. turpentine in ½ pint linseed oil. She soon got up, and in a few hours, though weak and tucked up, was feeding all right. No sooner had he got the mare up than a pony which had been running in the paddock was noticed to lie down, and, as he was considerably swollen, they gave a dose of ½ oz. turps and ½ pint linseed oil. This appeared to have the desired effect, as they had no further trouble with the pony. On the following day he had to treat a foal on his own farm. He was on his back, kicking at his belly. Whenever he stood up he tried without success to pass water. A drench of ½ oz. nitre in ½ pint linseed oil was given, and although he passed water soon afterwards he continued very restless, so much so that it was impossible to rub him at all. In view of the success with turps and oil in the previous cases, he tried this treatment, but as the foal continued to get worse he gave him 1 dram chlorodyne in half a pint of warm water. This quieted him enough to permit of hand-rubbing, and the application of hot fomentations to the belly. In two or three hours' time he again became restless, so another dose of chlorodyne was given. This was repeated, and in a few hours the animal appeared much better, though scouring badly. He then procured a piece of half-inch hose, and after rubbing it with vaseline passed nearly four feet of it into the rectum, and injected about a gallon of warm water. When the hose was removed a very free discharge occurred, and the foal quickly improved.

EXHIBITS.—Mr. Woolcock tabled good samples of prunes, Duchess pears, and Golden Drop plums, dried by himself. Messrs. Springbett showed splendid cut of lucerne, showing what could be grown by aid of irrigation in this district.

Redhill, March 21.

PRESENT—Messrs. Torr (chair), Darwin, Nicholls, Treloar, Button, Steele, Robertson, D. and J. N. Lithgow (Hon. Sec.).

HARVESTING.—Discussion on this subject took place. Mr. Treloar favoured the use of the complete harvester as the quickest and cheapest means of getting off the crop. Even where there is use for the straw on the farm it would be better to use the harvester and then cut the straw with a binder than to bind and head the crop. Members agreed that a good chaff-carrier on the harvester was an improvement. Something on the same principle as the sheaf-carrier on the binder was suggested, so that the chaff was left in heaps in the field, where stock could help themselves.

Kapunda, April 3.

PRESENT—Messrs. O'Sullivan (chair), Byrne, Kerin, Shannon, Flavel, Weckert, Vogt, Pascoe, Daly, and Holthouse (Hon. Sec.).

CONFERENCE AT SADDLEWORTH.—Members support proposal for Conference of Lower Northern Branches at Saddleworth about June.

PIG-REARING.—Mr. Shannon said that pig-rearing had become a very profitable adjunct to farming in this district, and of late years the industry had made rapid strides. The outbreak of swine fever and the consequent restrictions on the movement of pigs had completely disorganised the markets, until at present prices it was not profitable to raise pigs. He thought they should see whether they could not export pork to England at a profit. It was decided that the Hon. Secretary obtain information on this question.

FOXES.—Mr. Shannon called attention to the increase in the number of foxes in this district, and urged the necessity for taking active steps to destroy them. He suggested the formation of fox clubs, to pay for foxskins, the skins to be sold by the Secretary, and the proceeds credited to the funds of the club.

THE QUALITY OF WHEAT.—The Chairman was afraid that too often matters of importance brought forward by the Agricultural Bureau were allowed to drop. This applied particularly to the question of the wheat standard. In regard to wheat sent to the mill for gisting, for samples weighing 67 lb. per bushel they received 40 lb. flour, 12 lb. bran, and 6 lb. pollard, 2 lb. being allowed for waste in each 60 lb. In former seasons, with wheat going only 62 lb. per bushel, the miller gave them back just as much, and he thought it would be a good plan for the Department to carry out careful tests and publish the flour-producing qualities of the different samples of wheat.

Balaklava, April 8.

PRESENT—Messrs. Robinson (chair), Baker, Hams, Spillane, Tuck, Thomas, Goldney, Uppill, and Barden (Hon. Sec.), and one visitor.

LUCERNE HAY.—Mr. Robinson tabled sample of lucerne hay, from reclaimed Murray swamp land. All stock seemed very fond of it, and he thought it would prove excellent for dairy cows.

POISON WEED.—Mr. Spillane tabled plant of "wild tomato" bush, which he thought was poisonous. He had reserved a scrub paddock for his stock, but soon after turning in 20 head of young cattle two died. Upon making a *post-mortem* he found a large number of the berries in the stomach. Several members thought an excess of fibrous food more likely to be the cause, as they had plenty of the tomato bush on their land, but it had never caused any injury to stock.

USE AND CARE OF FARM IMPLEMENTS.—Mr. T. A. Thomas read a paper on this subject. Shelter, oil, and paint applied at the right time will save a deal of useless expenditure on implements, besides avoiding worry and loss of time caused by implements being under repair when they should be in use. While straw-covered sheds are cooler than iron, there is less risk of fire with the latter, besides which the iron roofs afford good catchment for water. Shelter for the implements will save the paint, and prolong the strength and effectiveness of most implements. If exposed to all weathers implements soon become rusty and cracked. To protect the woodwork against wet, paint should be used, but on the working parts, nuts, and bolts rub oil and grease. To the cogwheels apply black lead; grease and oil collect sand and grit, which assist to wear away the cogs. The belts, chains, and canvas on the binder

should not be strained tighter than necessary to make them run well without slipping. If a nut persists in working loose, tie around the thread of the bolt above the nut a piece of worsted which has been dipped in brine. All spring keys should be kept well spread. Keep the knives sharp; blunt knives work heavily as well as badly. Machinery when finished with should be thoroughly cleaned while the grease is soft and easily removed. Put plenty of oil in the fertiliser box of the drill when not in use; this keeps the cones in good order. Do not allow the fowls to roost on the implements. A few days before taking out either binder or drill, oil every cup, bearing, and spindle, also the knives of the binder. This will cause all the parts to work freely, and will save the strength of the horses, besides preventing undue straining of the machine.

Denial Bay, April 1.

PRESENT—MESSRS. Smith (chair) Dunnet, Lowe, Starling, Crocker, McKenzie, and Gale (Hon. Sec.)

DOES WHEATGROWING PAY?—This question was well discussed. The Hon. Secretary's estimate that the cost of producing a bushel of wheat in this district was 1s. 7½d. was criticised. Members were generally of opinion that wheat could not be profitably grown on the West Coast for less than 3s. per bushel, the cost of destroying rabbits being one of the principal items of expenditure.

Mount Gambier, April 8.

PRESENT—MESSRS. Edwards (chair), Mitchell, Pick, Watson, Norman, Wilson, Williams, Bodey, Wedd, Sassanawsky, Buck, Schlegel, Smith, and Collins (Hon. Sec.).

FOOTROT.—MR. W. J. T. Clarke forwarded from London a pamphlet dealing with footrot in sheep, and some discussion ensued. Some members held that the wet grass was largely the cause of footrot in Merino sheep; crossbred sheep were very free from rot. It was generally thought that the footrot described in the English pamphlet was not the same as that which used to be such a trouble in the South-East.

ENQUIRY INTO SOUTH-EASTERN CONDITIONS.—In reply to criticisms on his articles on this subject Professor Perkins stated that his figures concerning the yield of the cultivated land in the South-East were based upon the official statistics. This was clearly pointed out in the articles, and, while he did not claim that the figures were exact, he had endeavoured to arrive at a fair estimate. Most of the members expressed the opinion that the statement that the gross return from cultivated land in the South-East averaged £4 4s. 10d. per acre was greatly exaggerated. Figures were quoted to show that very rarely was even £3 per acre realised over a large area.

FEEDING DAIRY CATTLE.—Further discussion on losses of dairy cattle took place. Mr. Williams read a short paper on the feeding of dairy cattle as follows:—"From the sorry appearance of many milch cows about the town and other parts of the South-Eastern district, it is evident that they are in need of a more plentiful supply of food, containing richer properties, which will sustain them in health and vigour. If we look around to see where this is obtainable we shall see many straw stacks that might easily be made available. The straw should be chaffed, and soaked for twelve or 15 hours before using. No. 1 feed: Soaked chaffed straw 30 lb., 2 quarts bran, 1 quart pollard, 1 lb. molasses, and a dessertspoonful of salt; divide into two feeds, and give night and morning. Chaff may be added to this. No. 2 feed: Oat hulls (which have been soaked for twelve hours) 10 lb. (including water weight). They should only be wet enough to damp the following:—3 lb. chaff, 1 quart bran, 1 cup oatmeal pollard, and a little salt. The oat hulls, bran, and oatmeal pollard are all obtainable at our local oatmeal factories. Give two feeds daily. It will surprise owners to see how cows fed on No. 2 feed will respond. The cost of feeding on No. 2 will be under 2s. 6d. a week. The foods advised by Mr. Suter, the Dairy Expert, at Naracoorte, on the 5th inst., ensilage, etc., are not at present within our reach, though it is to be hoped we shall see more of them in the near future. We must do the best we can with what is easily and cheaply obtained. For a cattle lick the following should be kept

in boxes about the farm, etc.—Calcined bonedust (phosphate of lime), 10 lb., sweet bone meal 15 lb., salt 15 lb., sulphate of iron $\frac{1}{2}$ lb. Replenish boxes when empty. Cows, between the period of being dried off and that of calving, should be treated in a more humane manner than many of them are, and not turned out on country where there is little or no feed and bad water. Cows so treated develop a mania for all sorts of unnatural foods, including decomposing poisoned rabbits, etc., and many have died in this and other States as a result of this taste for uncooked bunny. Cows so treated can never do justice at the pail.

DISINFECTING PIGSTIES.—Mr. Williams submitted the following:—A useful paint for disinfecting pigsties, fowlhouses, etc.:—Two parts coal tar, one part kerosine. This mixture will kill all parasites and germs, and glue up their eggs and spores. Lime is almost useless as a disinfectant.

Port Broughton, April 15.

PRESENT.—Messrs. R. Whittaker, sen. (chair), R. Whittaker, jun., Tonkin, Patingale, Barclay, Harford, Gray, Evans, and Dalby (Hon Sec.).

TESTING WEIGHT OF WHEAT.—Some discussion on the discrepancy between weights of wheat shown at Adelaide Show and the same wheat tested on Mark Lane scales took place. Members would like to know whether the Chamber of Commerce arrived at the weight of the standard sample on the same method as that adopted by the show judges, and how it was that there were such marked differences in the weights. Discussion also took place on the conditions the Branches of the Bureau were asked to observe when sending wheat to the Chamber of Commerce in connection with the fixing of the f.a.q. standard for the season. Members were of opinion that the words "sold at full market rates on which no reduction has been made" should be struck out.

Riverton, April 15.

PRESENT.—Messrs. Davis (chair), Hannaford, Longbottom, J. W., J. E., and P. Kelly, Calf, Gray, Malcolm, and Cooper (Hon. Sec.).

PICKLING SEED WHEAT.—Discussion on this subject took place. Members differed in their opinion regarding the length of time before sowing that wheat should be pickled. All were agreed that 1 in. to 2 in. was deep enough to sow the seed.

Wilmington, April 12.

PRESENT.—Messrs. Robertson (chair), Bischof, A. and M. Schuppan, Sullivan, Broadbent, Zimmermann, Maslin, McLeod, and Payne (Hon. Sec.).

"JOURNAL" CRITICISM.—Mr. P. L. Sullivan called attention to several matters of interest in the March *Journal*:—1. Does the farmer benefit from a high f.a.q. standard for wheat? A long discussion on this subject took place. Members thought the evidence proved that the farmer did not benefit to an equal extent with the effort he puts forth to obtain such a result, the advantage of a high standard resting mainly with the merchant. If a farmer produces a sample over the f.a.q. standard, in the opinion of this Branch he should receive a higher price for it. 2. Does it pay to grow wheat? This was considered too abstruse a question for a definite reply, but, speaking generally, members held that in a good district wheatgrowing was profitable, but in the dry areas it was ruinous. 3. Poultry on the farm. It was agreed that poultry constituted an important factor in the production of the income of the farm, and they should therefore receive careful attention.

RABBIT DESTRUCTION.—The request of the Department for suggestions for the improvement of the present laws relating to vermin destruction led to considerable discussion, and it was resolved to suggest:—"1. That the Act should state that the owners of land must destroy the rabbits by a certain date or action may be taken by those in authority to prosecute." This may appear arbitrary, but it is imperative in the interests of the State. Any person doing good work in destroying would not be prosecuted; only those who

do next to nothing. "2. That a penalty be named for the first offence, and a substantial increase for subsequent offences." "3. That the Government in the *Gazette* declare the whole State rabbit-infested and call upon owners forthwith to destroy." Do away with the necessity for local governing bodies to give landholders notice. The Government to give this notice directly the new Act has been assented to, and to have force for all time. The intensity of the pest demands almost arbitrary severity, as many landholders will not destroy unless compelled. "4. The Government to destroy rabbits on all unoccupied Crown lands."

Clarendon, April 10.

PRESENT—Messrs. Payne (chair), A. and A. A. Harper, Phelps, Juers, Spencer, Pelling, Morphett, and Wright (Hon. Sec.).

CATTLE COMPLAINT.—Some discussion on this subject took place. Several members expressed the opinion that the trouble was due to too much dry feed and also to deficiency in nutriment. The provision of salt in the paddocks where the cattle could help themselves was advocated.

Dowlingville, March 24.

PRESENT—Messrs. Mason (chair), Montgomery, T. and H. Ilman, Phelps, Powell, Watkins, Whittaker, and Lock (Hon. Sec.).

CATTLE COMPLAINT.—Several members reported losses of cattle. Cows in milk appeared to suffer most; the tongue, or the jaws, appear to be paralysed, and the animal is unable to chew the cud. Mr. Mason said he had given some of his cows a mixture of sulphur, whitening, gunpowder, and vinegar, and they recovered. Mr. Phelps asked whether a cow that dropped the cud would be able to start again without assistance.

Mallala, April 3.

PRESENT—Messrs. W. Temby (chair), S. Temby, Moody, Loller, Nairn, McCabe, Murphy, Worden, and Nevin (Hon. Sec.), six honorary members, and one visitor.

CONFERENCE AT SADDLEWORTH.—Proposal to hold Conference of Branches at Saddleworth was heartily supported.

OPHTHALMIA IN CATTLE.—Mr. Moody reported existence of this complaint amongst his cattle. It appeared to affect only one eye.

FARMING.—Mr. A. F. Wilson forwarded a paper on present-day farming in this district. He thought even on small areas it would pay best to grow only one crop of cereals in three years on the same land. Fallowing should be put in hand in June or July, and the fallow well worked during the winter months. If weeds appear in the summer feed them off with sheep before they get too far advanced. Seeding should be commenced in April, putting in the slow-growing varieties first, and finishing with such wheats as Gluyas, King's Early, or Neumann's Early. He considered 1 cwt. per acre of commercial fertilisers sufficient to apply, but he would not use the same kind of manure for two successive crops on the same land. For hay he preferred to sow Cape oats early. He would roll the crop in June or July, according to season. After harvesting the wheat the stubble should be left, as it affords protection to the young grass, and gives earlier feed than bare land. In ordinary seasons the stubble paddock should keep a ewe and lamb to the acre. A good ewe will return at least 10s., which was more than would be obtained by cropping the land again; that is, after deducting cost of labour, etc. In this district lamb-breeding would pay better than the breeding of horses, although it was advisable to rear a few colts for their own use. He advised an iron roof for all machinery sheds, and would build them at some distance from any stack or shed with straw roof. Where sheep are kept good drafting yards were necessary. Posts should be eight feet apart, with four wires, with pig-netting attached, the race of upright slabs, and gates of stringybark. Mr. Moody agreed that it was best to leave the stubble for the protection of grass. He did not favour netting the drafting yards. Mr. Nairn considered it unnecessary to use other than mineral super so long as

that manure gave satisfactory results. Making a curve in the race of the sheep yards was a good plan. Mr. Butler agreed; he found the curved race very serviceable. Mr. Worden said a man with only 400 acres would be compelled to crop half each year. It was a mistake to leave the land out too long, as the feed went back. On his land bonedust was not so good as super; in adjoining paddocks under same conditions the crop manured with bonedust yielded 13 bushels and with super 23 bushels per acre.

Virginia, April 17.

PRESENT—Messrs. Hatcher (chair), Baker, Taylor, Sheedy, White, Huxtable, Thompson, Nash, Odgers, and Ryan (Hon. Sec.), and ten visitors.

COST OF WHEATGROWING.—The Hon. Secretary read Mr. Coleman's estimate cost of growing wheat on fallow, and considerable discussion ensued. Members were of opinion that the cost allowed for team and feed was under the mark. Nothing was allowed for rolling, which was considered by members to be necessary. Mr. Huxtable considered the prices too low altogether for daywork, and the feed mentioned was not enough for six horses in work.

Whyte-Yarcowie, April 15.

PRESENT—Messrs. Hack (chair), Pascoe, Dowd, Jenkins, Francis, Kornetzky, Mudge, Paul, Pearce, Rasmus, and Boerke (Hon. Sec.).

DOES WHEATGROWING PAY?—Mr. Pearce tabled the following estimate of income and expenditure on a farm of 600 acres, to prove that wheatgrowing alone did not pay in this district:—

Income.		Expenditure.	
170 acres of wheat, at 10		Rent, at 3s. per acre	£90
bushels, at 3s.	£255	5 per cent. interest on plant	
Dr. balance	38	(£400)	20
		10 per cent. depreciation on	
		plant	40
		200 bushels seed wheat	30
		4 tons manure	18
		Hay for horses	30
		Corn sacks	10
		Plough and cultivator shares	5
		Value of farmer's work	50
	£293		£293

The farmer's work is worth more than £50, yet at that price he loses £38 a year. [On the face of it, these figures include the cost of seed, manure, rent, etc., of the whole 200 acres cropped, 170 being left for wheat and 30 acres cut for hay. In the expenses the 30 acres are again charged for at £1 per acre, but nothing is allowed in the income for this hay.—Ed.]

HOME-CURED BACON.—The Chairman read the following paper on this subject:—He had selected this subject because the season was coming on. Farmers will soon begin to renew their stock of bacon. There were great differences between the factory system of curing and that adopted when curing for own use. The great aim of curing for trade purposes was to secure the less expensive and great aim of curing for trade purposes was to secure the less expensive and quickest method of curing, as the longer bacon was held the more weight it loses. The system of dry salting was almost done away with, as with proper care, once they got a good pickle, it would last for years; when necessary it can always be clarified by boiling. This is the system he had adopted: the various quantities of curing materials are as given for 1 cwt. of meat:—2½ oz. saltpetre, 6 lb. salt, 4 lb. black sugar, 1½ lb. allspice, 1½ oz. carbonate soda; mix all together. First rub all the meat with golden syrup or honey (honey for preference), using 1 lb. to every cwt. of meat. Now take about two-thirds of the mixture and rub it well in; time and care should not be spared in this first application. Now place the meat in a trough, hams and hands at bottom, with fleshy side up. A well-ventilated room should be used for this purpose. The second day, take out the meat, and rub in some more of the mixture, and so on, until all the preparation is used. Place the meat firmly together to raise the brine as high as possible. He usually boiled the

brine once every time it was used. In about 20 to 24 days the meat should be ready to come out. Immediately it was removed from the pickle scrub and clean it thoroughly with hot water. Draw off the pickle, and, after cleaning the trough, put the meat back again. Cover it with clean, cold water, and let it remain thus from 10 to 12 hours. It can then be taken out, and hung up to dry for 10 or 12 days. Mix together $\frac{1}{2}$ lb. each mutton fat and lard, and fill up all the holes in hams and hands, afterwards sprinkling oatmeal or pollard over the parts filled in. When smoked this will harden, and prevent any attack from flies. The meat is now ready for smoking. If the smoke is continuous, from two to three days will be found sufficient. A little olive oil rubbed over the cured article will tend to keep it soft, and give it a nice, rich colour. It should now be tied up in strong calico bags, and hung up in as cool a place as possible. He would like to say a few words about boning hams, which he did not think necessary, as the large bone, when removed, made the hams very unsightly. A good plan is to cut off, with a saw, the head or top of the large bone projecting from middle of the ham. Clean all the marrow out, running a drill or bit to the end. If the hams are large drill well into the joint, and keep this bone always full of the curing mixture. He had a smoke-house made out of an old iron 400-gall. tank, which answered the purpose splendidly. One side was removed; this is kept on the top, and used in extending the sides up about 18 inches. On this he fixed a gable-shaped roof, all wood, and very strong, as sometimes he had over 500 lb. of bacon hanging to the roof. The fitting should be very close, so that no smoke can escape. On top of this he had the usual roofing iron, and ridge cap, to protect it from the weather. At one end there was a smokepipe running out about 18 inches, with a smoke-slide, to regulate the smoke as required. In this front he fixed a smoke-door, 36 x 20 inches, on hinges, lining the edge of opening with wood. With a little care this can be made to fit very neatly. The whole structure, which now had the appearance of a small house or office, could be removed to any place required. The firebox consisted of an old copper-casing, let into the ground about 6 feet from the smoke-house. The sides were 12 to 15 inches high, and covered with old iron. A small opening is made to put in the materials to be used to produce the smoke, and the smoke is conveyed to the house by a 5-inch pipe. When the smoke-house is not required for its special purpose, it can be used for keeping small quantities of grain, etc., secure from mice.

MARSHALL'S No. 3 WHEAT.—Several members stated that they had heard complaints about the milling qualities of this wheat. Members wished to know whether there was any ground for such complaints.

RABBITS.—Mr. Dowd said he found that where he blocked up the entrances to rabbit-burrows with the old phosphate bags the rabbits did not get out. Apparently they would not eat through these bags.

Penong, April 15.

PRESENT.—Messrs. Oats (chair), Farley, Brooks, Shepard, Weber, Richardson, Saunders, and Wiseman (Hon. Sec.); and four visitors.

HON. SECRETARY.—Mr. W. G. Wiseman resigned this office, and Mr. H. A. Weber was appointed to fill the vacancy.

TAKEALL.—Mr. A. Brooks read a short paper on this subject. In his experience this trouble was worse on the plain than on scrub land, and also in soils worked when dry. He thought some insect was the cause, but he had noticed that oats and other plants grew well where the wheat failed. As an experiment he carted some "cocky" chaff on to a takeall patch and set fire to it: the following year he had a good crop where the chaff was burnt. Considerable difference of opinion existed amongst members as to the cause of takeall.

ANALYSES OF SOILS.—Members wished to know whether the Department analysed soils free of charge. [No. The charge, however, is very low, namely, 3s. for each item determined in each sample.—*Ed.*]

PURIFYING WATER.—One member reported that a number of small red worms were in a large tank of water, and he asked whether he could destroy the worms without wasting the water. He was advised to use a little blue-stone, one member reporting success with this treatment.

DOES WHEATGROWING PAY?—Considerable discussion on this subject, arising from paper read by Mr. Wiseman, and from Mr. Coleman's figures, took place. Members were agreed that they could not feed their horses for 1s. per day.

BEST WHEATS.—Mr. Brooks considered Steinwedel the best wheat for this district. Mr. Saunders favoured Gluyas, while Mr. Oats classed Smart's Early and Gluyas together.

Stockport, April 17.

PRESENT—Messrs. Perry (chair), Stribling, Smith, Godfree, Watts, Megaw, Nairn, and Murray (Hon. Sec.).

CONFERENCE AT SADDLEWORTH.—Members support proposition to hold a Bureau Conference at Saddleworth about the end of June.

FARMING IN THE NORTH.—Mr. C. Perry read a paper describing farming operations as carried on in the Upper North. Generally, he thought that the land might be worked better than it was.

Utera Plains, April 15.

PRESENT—Messrs. Hornhardt (chair), Abrook, Barrett, W. and H. S. Chase, Gale, Deer, Venning, A. R. S. and A. R. Ramsey (Hon. Sec.), and one visitor.

PREPARATION OF LAND FOR SEEDING.—Mr. W. Chase read a paper on this subject as follows:—Whilst each farmer must be guided by local conditions of soil and climate, a very good system, and one now generally followed, is to fallow each year about one-third of the wheatgrowing area on the farm. Preparing the land for seed should begin by fallowing the previous year, when the land is in the best possible condition for ploughing. The time of ploughing and the condition of the land when ploughed have most important influences on the result of the succeeding crop. The earlier in the season the fallowing is done, the better: late fallowing is generally done when the soil is in a half-dry condition, and leaves the land rough and lumpy, and much more difficult to work to a solid seedbed. With early fallowing sometimes two or more crops of weeds may be destroyed. The spring and summer cultivation of the fallow is an important factor in the preparation of the land for seed. The first cultivation should be given before the soil gets too dry, and when a good crop of weeds can be destroyed, the furrows well broken up, and the bottom, or seedbed, more consolidated. If rough on top after cultivating, every advantage should be taken to break it down during the summer by harrowing or rolling, or both. He believed strongly in the use of the roller in the preparation of the land for seed, and would always roll before the drill, if the land is rough and lumpy. If the fallow is well cultivated through spring and summer, and kept clear of weeds, it should not, under ordinary conditions, require a great amount of labour at seedtime, only the loosening of the surface 2 or 3 inches deep with a cultivator or other suitable implement. So far, he had dealt with the preparation of fallow land, and the farmer who depends on the fallows for his main crop is wise. The results from stubble or lea land are so uncertain that it is not advisable to put in any great quantity. The practice adopted by a great number of farmers in ploughing stubble land is either to plough all around a paddock, or else cut it into two or more blocks, and plough around each block. This is not so bad if the land is well scarified across afterwards; but ploughing this way renders the land more difficult to crosswork it all. He had seen paddocks worked this way every time (generally the longest way), and at seedtime the land is scarified the same way as ploughed. The seed is drilled the same way, and all the cultivation the land gets is done, one implement after the other, working the same way. The old way of ploughing in lands, working the paddock one way one time, and crosswise the next, was better, as

the cultivating implement can always be worked across all the furrows and all the ridges and pieces that might be missed by the plough are more likely to be broken or cut up. The chief points that should be followed were: a good ploughing at the right time: well working the fallows during the spring and summer: keeping the land clear of weeds: getting the land to a nice, fine tilth on top, with a good, solid seedbed underneath: and the use of suitable manures, drilled in with the seed, under favourable conditions. Some discussion took place on the best way to attach a team of horses to the plough. It was generally agreed that swings were better than spreaders.

Port Elliot, April 15.

PRESENT—Messrs. W. E. Hargreaves (chair), Pannel, Brown, Stock, Welch, Gosden, and W. W. Hargreaves (Hon. Sec.).

POTATOES.—Mr. Brown tabled samples of Bismarck potatoes, which were much admired. The yield was only 3½ tons to the acre: but this was due to want of water, which could not be applied until too late to do more than save the crop.

STRATHALBYN CONFERENCE.—Delegates reported on proceedings of Conference, and an interesting discussion ensued.

SWINE FEVER.—Members were of opinion that the development and spread of this disease were largely due to filthy surroundings of many piggeries.

DRYING OFF COWS.—In discussion on Mr. Suter's address at Strathalbyn, members were of opinion that cows should be dried off three months before calving, as they would milk better after a good spell than if kept in milk until within a few weeks of calving.

Maitland, April 8.

PRESENT—Messrs. Bowman (chair), Jarrett, A. and E. Lamshed, Bawden, Hastings, Moody, and Tossell (Hon. Sec.).

TAKEALL.—A lengthy discussion on this subject took place, the majority present being of opinion that the trouble was most prevalent when seed was sown in soil neither wet nor dry.

QUESTION-BOX.—It was decided to deal with questions each meeting.

Penola, April 8.

PRESENT—Messrs. Darwent (chair), McKay, Peake, McBain, Alexander, Ricketts, Pounsett, Kilsby, and two visitors.

HON. SECRETARY.—Mr. Allnutt tendered his resignation, as he had left the district. Mr. L. W. Peake was appointed to the vacant office.

MANURES FOR BARLEY.—Discussion took place on letter from Secretary for Agriculture on the manuring of barley. Members interested in barley-growing intimated their intention of testing the treatment recommended. Some discussion ensued on offer of the Department to supply seed and manure for a series of half-acre plots. Members thought the plots should be larger, and one agreed to take up the work if the plots were extended to three acres in area.

NARACOOORTE CONFERENCE.—The Chairman reported on proceedings of Conference. He made special reference to the recommendations of the Professor of Agriculture in regard to the use of lime, and also to the question of ensilage.

USE OF FERTILISERS.—It was decided to ask the Department to issue a leaflet dealing with the application of commercial fertilisers, especially in regard to the mixing of different kinds. Some of the members found that certain manures when mixed become pasty and cannot be applied with the drill.

Mount Bryan East, April 15.

PRESENT—Messrs. T. Wilks (chair), E. Wilks, James, Thomas, Teddy, Pohlner, R. H. K. and R. W. Dunstan (Hon. Sec.), and one visitor.

CONFERENCE AT SADDLEWORTH.—Members support proposal to hold a Conference of the Bureau at Saddleworth about June.

RABBIT DESTRUCTION.—In dealing with proposed amendment of the Vermin Destruction Acts members suggested that provision should be made:—
1. For simultaneous action to deal with the rabbits in February and July.
2. That the Government should be compelled to take the same action as private landowners.
3. That, instead of prosecuting defaulting landowners, the Councils should be empowered to do the work and recover costs.

Crystal Brook, April 15.

PRESENT—Messrs. Hamlyn (chair), R. and P. Parry, Townsend, Forgan, Robinson, Palmer, Davidson, Weston, Billinghamurst, Venning, Morrish, Solomon, Hutchison, and Symons (Hon. Sec.).

SEED WHEAT.—Mr. R. Townsend read a paper on "What Becomes of the Wheat we Sow?" Throughout this district the average seeding was one bushel per acre, and on this he would base his remarks. Having counted the grains in a pound of Carmichael's Eclipse wheat, he calculated that they distributed about 175 grains on every square yard. Allowing four stools to a plant, and only 25 grains to each head, if every seed produced a plant this would represent a yield of 100 bushels per acre. Why did they not get such a return? Mainly because a large proportion of the seed does not grow. On a field which produced 13 bushels per acre he counted the stools per square yard, and found they averaged 40. What had become of the balance of the grain sown? Birds, mice, and losses from malting account for a lot, but not all. He attributed the main loss to injury to the seed in reaping. He was convinced that they did not exercise enough care in reaping their wheat. The beaters of the reaper or harvester destroy the germ on a large proportion of the grain. Wheat carefully gathered and sown will produce a much thicker stand than the seed from the stripper.

Morgan, April 15.

PRESENT—Messrs. Hahn (chair), Lindner, Hausler, Pope, Seidel, Hewitt, R. and H. Wohling (Hon. Sec.), and five visitors.

DOES WHEATGROWING PAY?—Mr. H. Hahn read a paper on this subject. Two months ago in discussing this question the Branch decided that if they could average a bag to the acre every year they could meet expenses. In the March issue of *The Journal*, Mr. Coleman, of Saddleworth, showed it cost £1 9s. 7d. per acre to grow wheat on fallow. How, then, could they pay expenses here on four bushels? In rent and manure there were great differences. At Saddleworth rent was 8s. 8d. per acre, at Morgan 1d.; at the former place they spent 4s. 3d. per acre for manure, while here it was not needed. In seed there was a saving of 1s. 8d. per acre. Rates, taxes, labour, cornsacks, etc., also cost less per acre. Altogether the cost of growing wheat here would come to about 11s. 7d. per acre. If stubble land is cropped it is only scarified, at a cost of 1s. 6d., and the total expense would not be more than 6s. 8d. per acre. If they get sufficient rain, say, 8 in., between April and October, they can grow fairly good crops, but unfortunately they often failed to get as much rain. During the past ten years his average yield had been under 1 bushel per acre.

Woodside, April 17.

PRESENT—Messrs. Fowler (chair), Hutchens, W. and H. Rollbusch, Johnston, Lauterbach, and Hughes (Hon. Sec.), and two visitors.

HOLSTEIN BULL FOR EXCHANGE.—Members suggested that some other Branch might desire to obtain the services of the purebred Holstein bull purchased by this Branch several years ago. As his heifers are now coming in, it was considered advisable to try to exchange or otherwise dispose of the bull.

LUCERNE.—Mr. T. Hutchens read a paper on "Lucerne." He considered lucerne one of the most nourishing and productive fodders they could grow. He had been growing lucerne successfully at little cost for over twenty-five years. To secure such results thorough working of the land was necessary. He ploughed to a good depth in June or July, re-ploughed it again about the end of August or beginning of September, and harrowed and rolled the land until he got a very fine tilth. Before sowing seed in October he again ploughed the land, harrowing and rolling it the same day. Care should be taken to plough only as much as can be harrowed and rolled the same day, otherwise the seedbed cannot be got as fine as desirable. If the seed is drilled in 6 to 8 lb. per acre is sufficient. He applied 2 cwt. per acre of bonedust with the seed. His experience had been that he could get three or four cuts the first season, and about the same for the next two or three years, without any extra cultivation or manure. It was then advisable to use the scarifier between the rows, and in July or August give another dressing of manure. Under such treatment they could reasonably expect four good cuts each season. As a summer fodder lucerne is splendid for stock during the hot weather when other feed is dry. If there is more than sufficient for stock as green feed the rest can be converted to ensilage or hay. Lucerne was a first-class food for milk production, and their dairy farmers would do well to devote more attention to it, especially where water was available for irrigation.

Rhine Villa, April 14.

PRESENT.—Messrs. G. A. Payne (chair), F. F. and H. W. Payne, Mickan, Hecker, W. T. and J. W. Vigar (Hon. Sec.).

BEST WHEATS.—Mr. F. F. Payne read a paper on "Wheats most Suitable for this District." On the Murray Flats, where the rainfall was so scanty, and the seasons so unreliable, it was absolutely necessary that the farmer should secure wheats that will come to maturity on a very small rainfall. In the course of time, with experimental plots in dry districts, some advance in this direction may be secured. Such wheats as Neumann's Early, Gluyas, Steinwedel, and King's Early had done remarkably well last season. In a good year, however, the slower maturing varieties yielded better than the early sorts, and it was for the farmers to consider whether, with good cultivation and the use of manures, such wheats as Dart's Imperial and Marshall's No. 3 will not, over a period of years, pay best. If these wheats are well out of the ground in April, and the land has been well cultivated, they usually give a good return. Members generally agreed with the paper. Early in the season 30 lb. of seed per acre was considered sufficient to sow in this district, but the quantity should be increased to 45 lb. for later sowings.

Yorketown, April 8.

PRESENT.—Messrs. Correll (chair), Bull, Domaschenz, Anderson, Koth, and Newbold (Hon. Sec.).

CATTLE COMPLAINT.—The Chairman read a paper on this subject. He had lost a number of cows from a complaint during the past 25 years, and was of opinion that the trouble was due to fever, dry bible being one result of the fever. Usually cows in good condition die within one to three days of first sign of attack; but on one occasion he opened a poor-conditioned cow that lingered for four or five days after she got down. The bible was only loosely filled, but the urine was black, and could be scraped off with a straw; the paunch was nearly empty. He had cows die of this disease in all seasons of the year. Where treatment has been effective careful feeding was necessary, as digestion was very weak. He found a mixture of boiled oats and hay chaff very good; a handful of salt in the mixture is an advantage. As far as his experience went, the first noticeable symptoms of the disease were as follows:—The animal does not herd well with other cows, and will eat any dead animal matter, or excreta of other animals than its kind. Later on, when driven, it will stand with back roached; the tongue becomes pointed and dark; the beast refuses to eat or drink, though apparently it would like to do so. With milking cows, the first symptom may be the falling off in the milk yield. He was afraid the Government had not fully realised the severe losses experienced by South Australian farmers from this trouble, or

more would have been done to ascertain the cause. Until the real cause was known, any treatment was merely haphazard. It was noticeable that the complaint was more prevalent in cattle grazing on cultivated land. Some kinds of well water appear to act as preventive of the disease. Considerable difference of opinion existed as to the cause and nature of the complaint, but members were agreed that greater efforts should be made by the Government to thoroughly investigate the matter.

Caltowie, April 17.

PRESENT—Messrs. Royal (chair), C. and A. Kerr, Neate, N. and E. Hewitt, Graham, A. and J. McCallum, Petatz, Ferguson, McDonald, Jettner, Potter, Wilson, J. and F. Lehmann (Hon. Sec.).

PRIZE WHEAT AT ADELAIDE SHOW.—It was decided to hand the cup won by the Branch for best exhibit of Agricultural Bureau wheat to Mr. G. Petatz, the grower of the wheat in question. Several members spoke very highly of Mr. Petatz's efforts to produce a good sample of wheat. Even for market he went to what many farmers would consider unnecessary trouble, viz., winnowing his wheat twice, however well it looked after the first run. A pleasing feature in connection with the winning of this prize was that the variety shown, Petatz Surprise, was originated by Mr. Petatz. In thanking the members, Mr. Petatz said he was pleased that the Branch had won the cup offered by the Agricultural Society. He was a strong believer in thorough cleaning of his wheat, and it was his intention to devote special attention to improving the yielding quality of Petatz Surprise Wheat.

Minlaton, April 8.

PRESENT—Messrs. Evens (chair), Parsons, Nankivell, Vanstone, Correll, Martin, A. and J. McKenzie (Hon. Sec.).

HORSE COMPLAINT.—Members reported losses of horses, apparently from worms. Losses of cattle were also reported, and it was decided to ask that Veterinary Surgeon Desmond should be asked to visit the district.

TIMBER SUPPLY.—Mr. A. McKenzie read a short paper on this subject. It was very evident that the supply of timber for fencing and firewood was becoming smaller every year, and the question arose, should they not do something to provide for the future? Everywhere he went on the Peninsula he noticed the fence-posts falling over by the scores and hundreds. This was largely due to natural decay, the fences having been erected for 20 to 25 years; but the main cause was the ravages of white ants. Within the next 15 or 20 years many hundreds of miles of fencing would have to be renewed. Iron standards would, no doubt, be largely used; still, they would require timber for strainers, gateposts, etc., and, in his opinion, it would not be an easy matter to meet their requirements. Then, so far as firewood was concerned, they were using freely of their supplies without making any provision for the future. The mines and works at Moonta and Wallaroo, salt factories at Edithburg, flourmills at Port Vincent, Port Julia, Port Wakefield, and Ardrossan, and the limekilns in various parts, were using immense quantities of firewood. Then all along the gulf wood was being shipped across to the eastern side in great quantities. With all this, and the home demand, it would be seen that the available supply of firewood was diminishing at a fairly rapid rate. Was it not time that they gave serious thought as to whether they could not do something to renew their timber supplies? They all knew that, owing to the long spells of dry weather and the cutting winds experienced on the Peninsula more or less every year, it was somewhat difficult to establish young trees. Once they got a good start several of the gums did well, and they should experiment with these on a small scale. This could be done in three different ways. First, by planting one or more rows of trees round the paddock close to the fence. This was considered the best way by many people, but it had several drawbacks. The trees were too much exposed to the weather, and also to the risk of being scorched by fire when stubble or rubbish is being burnt. Then the bark and small twigs are blown some chains into the paddock: when the crop is cut for hay these get bound up with the wheat, and prove very objectionable. A better way is to plant clumps of trees in the corners of the paddock, and also in other parts. The positions and the size of such plantations must be left to the discretion of the individual. It will be noticed, however, that a clump of trees gives more

shade and shelter to stock than a row all round the paddock, and would also be much easier to protect against fire or injury by stock when young. If it is decided to plant a larger area, 20, 30, or 40 acres could be fenced off, and the gum seeds sown with the wheat or other cereal crop. In the local cemetery paddock they had a good object-lesson that the trees will thrive if they strike a good season. A few years ago he heard of a gentleman in Victoria who got splendid results in a short time with gum trees. In reply to enquiries, he stated that he made it a practice, where he found a fallen tree, to scatter some seeds amongst the tops. The old tree acted as a fence, and also as shelter, while the decay of the leaves and small branches supplied the young trees with the food they required. This plan might well be followed where the sheoak and tea tree were fairly prevalent.

Orroroo, April 14.

PRESENT — MESSRS. Moody (chair), A. and W. Robertson, Lillecrapp, Brown, Copley, and Tapscott (Hon. Sec.).

FERTILISERS.—Mr. W. T. Brown read a paper on his experience in putting in wheat with the drill and with manure in the Hundreds of Coomooroo and Eurelia during the past four years. He had applied super at rate of 40 lb., 50 lb., 60 lb., 70 lb., 80 lb., and 100 lb. per acre. He had got just as good results from the application of 50 lb. per acre as from 60 lb. or 70 lb. per acre, and better than from the heavier dressings. He was satisfied that in these dry areas 50 lb. per acre was quite enough to apply. In 1901 manured about 350 acres with super, and 100 acres with farmyard manure. The respective yields per acre were: $7\frac{1}{2}$ bushels and 5 bushels, and on the broadcast area 3 to 4 bushels. The rainfall for the year was 10.54 inches. Next season 570 acres were manured, but the rainfall was only 6.57 inches, of which 2 inches fell in December, and no crop was reaped. But for damage by grasshoppers the manured land would have produced enough for seed. In 1903, 100 acres were manured with super and 180 with farmyard manure. The rainfall was 14.26 inches, and the yields 12 bushels and 8 bushels respectively. Last year he put 500 acres in with mineral and guano super, the yields averaging about 6 bushels. The rainfall was 12.42 inches; but the dry weather during September and early part of October spoiled the crop. About 200 out of the 500 acres was on the light or grey land, which did not respond to the use of super. He was, however, satisfied that on the red and sandy land it would pay them to apply a light dressing of super. In preparing the land for seeding it was a mistake to leave too many furrows. He would plough in fair-sized lands, then scarify and harrow well, to get a firm seedbed. This would prevent the drill sowing the seed too deeply—a mistake that will easily occur unless care is taken. Mr. W. Robertson said his experience was very much the same as Mr. Brown's, and he agreed with him that it would pay to use manure here. He thought they would do well to study the methods adopted by farmers in the lower areas in the treatment of their land. To secure a firm seedbed and a fine tilth frequent working of the land was necessary.

Forest Range, March 16.

PRESENT—MESSRS. Monks (chair), McLaren, Vickers, Sharpe, H., A., J., and F. Green (Hon. Sec.), and one visitor.

THE SUCCESSFUL PRODUCER.—Mr. McLaren read a short paper on this subject. Although his experience in dealing with produce had been limited, it was sufficient to convince him that, in the long run, the man who produces a good article will be successful. This applied equally to the farmer, the dairyman, and the orchardist. The better the articles they have to market, the easier it is to dispose of them. This was particularly the case with fruit and vegetables. Let anyone go to the East-End Market, and he will find that the best stuff not only fetches the best price, but sells first. It was evident, therefore, that there must be no slumming of their work. They must plant of the best, prepare the land well, and do everything their observations teach them is necessary to secure first-class produce. They must give special attention to finding out the varieties that best suit their particular conditions. In regard to fruit, they must find out also the kinds that sell best. They must study the best methods of packing and grading, and not permit inferior fruit to be sent away. In fruitgrowing or gardening, the man who has just as large an area as he can attend to properly is likely to be the most successful.

Wilson, April 15.

PRESENT—Messrs. Harrison (chair), Nelson, Hilder, Sexton, Barnes, Logan, Crossman, Need, and Neal (Hon. Sec.), and seven visitors.

SHEEP ON THE FARM.—Mr. Hilder read a paper on "Does it Pay the Small Farmer to keep Sheep?" He often wondered why the farmers in this district looked with such disfavour on sheep. They had proved beyond doubt that they could not rely upon wheatgrowing alone, and he would strongly advise them all to keep a few sheep. Care must be taken not to overstock, but any farmer with 1,000 acres of land could easily keep 100 sheep; in fact, for six months of the year they could be kept on feed that would otherwise be wasted. First, there was the stubble land, intended for cropping the following season; after the horses and cattle have picked up all they will eat, the sheep will do well for some considerable time. Then sheep will keep clean the land intended for fallowing, and for the rest of the year will, if the farm is properly subdivided, do well after the other stock have been shifted. It was advisable to shift the sheep from paddock to paddock fairly often. It was a recognised fact that, with plenty of water, sheep will do fairly well where other stock would nearly starve. If the sheep are judiciously selected and properly managed, 100 breeding ewes would pay well: lambs will realise 10s. each, and the wool 3s. 6d. per ewe. The land would, of course, have to be sheep-proof fenced, and in this district the sheep yarded at night. He recommended crossing the Merino ewe with Shropshire ram. Members generally agreed with Mr. Hilder; but there was some difference of opinion as to the number of sheep the land would carry.

Reeves Plains, April 14.

PRESENT—Messrs. Folland (chair), Alexander, George, Arnold, Day, R. H. and W. Oliver, Shephard, and McCord, and three visitors.

COST OF HARVESTING WITH BINDER.—Considerable discussion took place on figures quoted by Professor Perkins in his report on the Roseworthy harvesting operations. Members strongly commented on the statement that 30 acres, averaging 1½ tons of hay per acre, could be cut for £4 3s. They considered the figures much under the actual outlay, and several intimated that they would be glad to sell their binders if the College authorities, or anyone else, would cut their crops for them at the price stated. The following resolution was carried:—"That the members are staggered at Professor Perkins' estimate of cost of binding 30 acres of crop."

PROTECTING HAYSTACKS FROM MICE.—Mr. George said that, as a buyer of hay, he could speak from experience of the losses caused by mice. A simple and effective means of preventing mice getting at the stacks would mean the saving of thousands of pounds annually. He had thought of building his stacks on short posts, and placing something round the posts to prevent mice climbing up. Mr. Alexander suggested fixing galvanised iron several inches in the ground all round the stack, allowing it to lean against the stack. This would cost a little at first, but the iron would last for a number of years. Mr. Shephard said he saw in the North iron set in the ground, and the top edge turned over; this was to keep mice out of a shed, and was said to be effective. [Some time ago the following plan was stated by a farmer to have proved effective:—Around the site of the stack iron was let into the ground to a depth of about 6 inches, the iron having a slight lean outwards above ground. A few pieces of wood were laid from the bottom of the stack to the top of the iron, to permit any mice brought in with the hay to escape. As the mice could not climb up the iron from outside, the stack was soon cleared.—ED.]

PICKLING WHEAT.—Discussion took place on relative merits of formalin and bluestone for pickling wheat. Mr. Day found formalin an effective preventive of smut; but he thought it injured the grain more than did bluestone. The Chairman was a strong believer in bluestone. He did not consider it necessary to pickle the seed every year; if done thoroughly once in three years that would suffice. Members passed a resolution in favour of pickling wheat with bluestone.

Wepowie, April 18.

PRESENT Messrs. Gale (chair), Crocker, Bishop, Hehir, Roberts, McNamara, and Halliday (Hon. Sec.), and two visitors.

DEPTH TO SOW WHEAT.—Discussion on this subject took place, members generally favouring shallow sowing. Two inches was considered the limit, and in dry ground shallower than that. One member considered the deeper sown, within reason, the better, provided the land was wet.

Eudunda, April 17.

PRESENT Messrs. Walter (chair), Martin, Kluske, Schiller, Sieber, Pfitzner, and Weil.

IMPROVEMENT OF HORSE STOCK.—Mr. J. von Bertouch forwarded paper on "Stallions at Shows, and Improvement of Horse Stock," to the following effect:—One of the principal items in the prize-lists of the country shows should be the classes for stallions; but the district in which the show was held should receive some benefit from the services of the stallions exhibited. It was important that the best available stallions should be secured, but it often happened that the first-prize animal was quite unworthy of that distinction, and many of the stallions were unsuitable for breeding purposes. Then frequently stallions were brought long distances to compete at country shows, without any opportunity being given to breeders in the district to secure their services. He favoured offering substantial prizes for both draught and roadster horses, on condition that the winners should serve a certain number of mares at a stated price in the district. By doing this the district would benefit, and there would be some encouragement to stock-owners to purchase first-class stallions. Funds for such prizes could be raised by imposing a licence fee of £10 or less per annum, and it should also be provided that all stallions travelling for hire should be subject to veterinary examination for soundness. This would soon result in an improvement of stock; inferior stallions would be castrated. Owners of stallions desirous of travelling them for hire should be compelled to submit the horses to examination, and he would also make it punishable for the owner of a mare to make use of the services of an unlicensed stallion. Similar action is taken in many European countries. In some the Government keep stud farms to provide suitable stallions, while others subsidise approved stallions; but all are required to pass a veterinary examination. Under the scheme he suggested the money should be allotted to the Agricultural Societies in the districts where the money was raised, and provision should be made for offering prizes to be competed for by the progeny of previous years' winning stallions. The same stallion should not be permitted to take the prize for more than two or three years in succession, nor to travel the district for more than three or four years. He urged the members of the Bureau to take this matter up, and ask the Government to impose a tax on stallions.

Angaston, April 15.

PRESENT Messrs. Rundle (chair), Friend, Player, A. and S. O. Smith, Salter, Snell, Trimmer, Sibley, Evans, Plush, Thorne, Shannon, and Matthews (Hon. Sec.), and seven visitors.

MARKETING OF PRODUCE.—Considerable discussion took place on co-operative action on the part of fruitgrowers. Members recognised the benefit to be derived from a uniform system of grading fruit, better packing, prevention of over-supply of any one line, and the securing of fair prices for the produce. A strong co-operative society to push the sale of the produce throughout the Commonwealth would be of great advantage to growers, and could regulate supplies when prices were low. Mr. Walter Smith, of Yalumba, gave an interesting account of a recent trip through India.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	May 17	June 14	Minlaton ..	May 6	June 10
Bagster ...	20	17	Morchard ..	13	—
Balaklava ..	—	10	Morgan ..	13	10
Booleroo Centre ..	16	13	Morphett Vale ..	16	—
Bowhill ..	6	3	Mount Remarkable ..	18	15
Brinkworth ..	5	2	Nantawarra ..	17	14
Burra ..	19	16	Naracoorte ..	13	10
Cherry Gardens ..	16	13	Norton's Summit ..	19	16
Clare ..	19	16	Onetree Hill ..	18	15
Clarendon ..	8	—	Orroroo ..	12	9
Colton ..	6	3	Penola ..	13	10
Crystal Brook ..	13	—	Petina ..	20	—
Eudunda ..	15	19	Pine Forest ..	16	13
Finniss ..	1	5	Port Broughton ..	13	17
Forest Range ..	18	15	Port Elliot ..	20	17
Gawler River ..	19	16	Port Lincoln ..	19	17
Gladstone ..	6	—	Port Pirie ..	13	10
Golden Grove ..	18	15	Redhill ..	16	—
Gumeracha ..	15	12	Richman's Creek ..	22	19
Hartley ..	19	—	Riverton ..	20	17
Inkerman ..	16	13	Reeves Plains ..	19	—
Johnsburg ..	13	17	Stockport ..	15	12
Kanmantoo ..	19	16	Strathalbyn ..	15	19
Kingscote ..	8	12	Utera Plains ..	20	17
Kingston ..	27	24	Virginia ..	15	12
Koolunga ..	18	15	Wandearah ..	15	12
Koppio ..	18	15	Wepowie ..	16	13
Longwood ..	20	17	Whyte-Yarcowie ..	20	17
Lyndoch ..	18	13	Willunga ..	6	3
Maitland ..	6	3	Wilmington ..	17	14
Mallala ..	1	5	Wilson ..	13	—
Mannum ..	19	16	Woodside ..	15	—
Meningie ..	13	10	Woolundunga ..	6	3
Millicent ..	4	1			



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

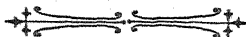
Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from March 29 to April 25, 1905.*

Trade or Calling.	Number Registered.		Number Employed
	Town.	Country.	
Laborers and youths	38	49	182
Masons and bricklayers	1	1	—
Carpenters	—	—	1
Boilermakers and assistants... ..	1	—	1
Blacksmiths and strikers	—	—	1
Fitters and turners... ..	2	—	2
Enginedrivers and firemen	2	1	—
Moulders	—	—	3
Brassfinishers	—	1	1
Ironworkers and plumbers	2	—	—
Painters	1	—	2
Compositors	1	—	—
Watchmaker	1	—	—
Warders	2	—	—
Apprentices	14	1	2
Cleaners	6	14	5
Porters and junior porters	10	6	3
Rivet boys	2	—	—
Totals	83	73	203

April 25, 1905

A. RICHARDSON, Bureau Clerk.



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OF THE

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OF SOUTH AUSTRALIA.



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R. W. FOSTER,

Minister of Agriculture.

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GENERAL NOTES.

Agricultural Bureau Membership.

In accordance with the decision of the Council of Agriculture, one-third of the members of each Branch of the Agricultural Bureau must retire during the present month. This, of course, does not mean that these members will sever their connection with the Bureau; every one of them is eligible for re-appointment. The main purpose of the provision for the retirement of one-third of the members is to afford Branches the opportunity of quietly dropping undesirable members, viz., those who will not attend regularly or take any interest in the work of the Bureau. The rule adopted by the Council is that the members lowest on the attendance roll for the year shall retire. Where the exact number cannot be determined in this way, *i.e.* if two or more have the same record, lots should be drawn. While each Branch may decide for itself when and how the question of re-nomination of members shall be settled, there is little doubt that the most satisfactory way will be to at once re-nominate those of the retiring members whose services it is desirable to retain. If this is done, these gentlemen may be treated for all practical purposes as having continued uninterruptedly as members. Hon. Secretaries of Branches should, prior to the June meeting, prepare a statement showing the number of meetings attended by each member during the year, and at the meeting complete the statement. Before the meeting closes, the names of the members to retire should be mentioned, and, as before stated, if it is considered desirable to do so, a resolution may be carried re-nominating any number of the retiring members. In the event of there being 16 members of a Branch five will retire, but if there are 17 on the roll the quota will be six.

Reduced Freights for Butter.

It has been recently announced that the dairy factories of Victoria, working in conjunction with the Department of Agriculture of that State, have entered into a contract with the representatives of the Lund, White Star, and Aberdeen lines of steamers for the conveyance of butter to London at a charge of 3d. per lb. This represents a reduction of 50 per cent. on prices charged by the mail companies in the past, and will prove an immense boon to the butter producers of Australia, as the mail companies have also reduced their charges to 7-16d., with certain discounts to loyal shippers. This effectively disposes of the bogey that the Sea Carriage of Goods Act imposed such hardships on the shipping companies that the trade in refrigerated products would have to be dropped or freights increased to cover the additional responsibilities placed

on the shipping companies. In view of the extreme rates charged for fruit, and the additional tonnage that will be available, it behoves the fruitgrowers of Australia to combine to demand a reasonable reduction in present charges. The development of our fruit industry depends very largely upon our ability to sell fruit in Europe at 9s. to 10s. per case, and without a considerable reduction in freights and other charges this price does not leave sufficient margin for the grower.

Export of Pears.

During the past fruit season considerable quantities of pears have been exported to Europe. Unfortunately, much of this fruit has arrived in bad condition, and has realised only a few shillings per case. On the other hand, fruit that arrived in good order has sold at from 15s. to 30s. per case. It is evident, therefore, that when we discover the conditions under which pears will carry to Europe in good order there will be a marked development in the pear industry. South Australia can grow pears of exceptional quality, and these pears will keep in the ordinary gardener's storehouse for three or four months, yet they do not carry in cool storage to London, a voyage of six or seven weeks. Why this should be is difficult of explanation. Too close packing of the cases and insufficient ventilation, with consequent heating of the fruit, may be important factors.

Booming New Fruits.

Recently much has been published concerning the work accomplished by Luther Burbank, of California, in the improvement of fruits. This generally has been of such an extravagant character as to tend to discredit the good work done by that able horticulturist. In a recent issue of *The California Fruitgrower* Mr. Burbank protests strongly against the ridiculous statements being made and the false impressions which they convey. Many of the claims he is alleged to have made for some of his recent horticultural creations he repudiates. He mentions the glowing advertisements concerning one of his new plums. He stated that this is a very good plum for certain purposes, and was sold to a firm of nurserymen on the distinct condition that it should only be represented for what it really was. Instead of this, however, the firm published illustrations four times the natural size of the plum, and, to use his own words, "My description was garbled, sentences transposed and changed, until I was made to say the opposite to what I did say." The fruit, in short, was represented to be of exceptional value for all purposes for which plums are grown, whereas such was not the case. Fruitgrowers are well advised to accept the nurserymen's descriptions of new fruits with more than a grain of salt.

South Australian Wines.

The export of South Australian wine to the neighbouring States has progressed by leaps and bounds since the accomplishment of federation. That this increase in our export is causing heartburning amongst Victorian winemakers is evident from statements published in the Melbourne papers recently. The growers state that the industry is in a bad condition, and that this is due to competition with "cheap adulterated wine from South Australia." The motive underlying this statement is shown in the context, viz., that our exports to Victoria during the three years, 1898, 1899, and 1900 totalled 258 gallons, and during the three years ending December 31, 1904, reached 165,959 gallons. Some of the leading newspapers have devoted considerable space to the alleged iniquities of the South Australian winemaker, and state that the fact that the Victorian winemaker is subjected to stricter laws than the South Australian maker is hampering the former. As, however, the same law in regard to adulteration applies to all wines sold in Victoria, whether made locally or in South Australia, the absolute futility of the above argument is apparent. Added to this is the fact that numerous analyses of our wines by the Victorian health authorities have failed to disclose any adulteration. It is true that a few samples contained more sodium chloride than the Victorian law permits, but we know that grapes grown on certain soils naturally contain more salt than the standard set up in the Victorian Act. In regard to alleged adulteration, South Australian wines have nothing to fear from fair comparison with those of the neighbouring States.

Caterpillar Plague in the South-East.

For many years the oat crops in the South-East have at intervals been devastated by caterpillars. A prominent farmer stated recently that the oat crop in the Millicent district was reduced by fully 10 bushels per acre by these caterpillars, several very promising crops not being worth harvesting, while scarcely any but suffered severely. While the severity of the attack varies from year to year, it is stated that the pest is becoming more destructive. Where the caterpillars travel from crop to crop various methods have been adopted, with more or less success, for checking their progress, but the greatest mischief is done by the immense numbers of caterpillars which hatch out from the eggs which are laid by the moths on the oat plants. The magnitude of the losses caused by these caterpillars renders the discovery of some effective way of dealing with them a matter of great importance, not only to the South-Eastern farmers, but to the State generally. A careful study of the habits of this particular caterpillar would be necessary to determine when and where preventive measures would be most effective.

Feed for Stock.

There is little doubt that in the near future more stock will be carried on the average farm in this State, and that a greater proportion of the raw material produced on the farm will be converted into a more valuable and concentrated product. Before, however, any great progress in this direction can be made, greater attention will need to be paid to the growing of fodder crops. In this connection, the particulars given by Mr. Mills, of Kanmantoo Branch, and Mr. Kilsby, of Penola Branch, are worthy of careful study. The amount of succulent green feed that can be grown on a few acres of well-prepared land is surprising. It will also be found that stock make better use of the ordinary grass or stubble if a small paddock of green feed is available as a change. In this direction the most promising crops to grow are kale, rape, maize, sorghum, and lucerne.

Light-weight Manure.

Quite a number of complaints are being made by farmers that where manure is delivered ten bags to the ton there is often considerable shortage in weight. A number of instances are given where supposed 2 cwt. bags contain from 218 lb. to 224 lb., instead of 226 lb. gross. These complaints refer mainly to imported brands, but local brands are not entirely exempt. To a certain extent farmers have the remedy for this in their own hands, viz., to refuse to accept English weights, or 10 bags to the ton. We believe the short weight is due mainly to evaporation of moisture, and though the local works usually allow about 2 lb. to cover this, it may happen that if the manure is in the bags for three or four weeks it will lose several pounds in weight. This being the case, farmers who test the weights of the manure should do so immediately on receipt of the consignment. It should also be remembered that the samples from the local works that are tested by the Department are drawn from the bags that are freshly filled, and if these show the manure to be up to the guarantee any subsequent loss in the gross weight means that the manure is more concentrated; in other words, there is just as much plant food present, but less water.

Smoked Rabbit.

Within the past few months considerable interest has been manifested in the proposal to utilise the rabbit in the preparation of an extract of meat. The scheme as outlined seems feasible, but there is the one great drawback that the rabbits must be brought to the works. This entails considerable cost and labour, besides much loss of carcasses during the hot weather. In the report of the Davenport Branch of the Agricultural Bureau an account is given by Mr. A. McDonald of a method of curing rabbits where they are trapped. The salt, smoked rabbit prepared by Mr. McDonald is attractive in appearance and also very tasty. The plant required is very simple and inexpensive, and can be moved from place to place as rendered necessary by the prevalence or otherwise of

the rabbits. Practically all losses are avoided, and as the weight of the treated carcase is less than that of the fresh rabbit, carriage is reduced to a minimum. If care is taken to put this product on the market in good condition there should be a considerable demand, both locally and for export. The scheme, at any rate, is worth a thorough test.

Foxes.

Complaints are coming from all quarters of the depredations of foxes, which are everywhere invading fresh districts. Organised and co-operative effort on the part of landholders in poisoning foxes should be taken in hand, especially in those districts where they are not yet very numerous. The following note has been supplied to the daily press by Mr. Harry Bickford, the well-known stockowner:—"Some years ago we were troubled in the South-East with wild dogs. At that time we adopted the plan of putting a bell on one in every fifty sheep to scare the dogs, and at the same time kept traps and strychnine always out as destroyers. We are pleased to say we are now seldom troubled with wild dogs. This year, with our ewes in lamb, we put amongst the flock dry sheep with bells on their necks (72 bells), and poisoned our country thoroughly with strychnine baits. We are pleased to say the loss of lambs up to date has been small, while the deaths of foxes have been over 40."

Roseworthy Agricultural Experimental Vineyard.

Good rains having fallen during April, sufficient to soak the soil to a fair depth, the ploughs were put into work as early as possible. The rains have been good, having come in falls of one half-inch to one inch at a time. With intervals of fine weather in between, the work has been pushed on rapidly. The first ploughing is now well in hand. Pruning has been started, both on the vines and on the fruit trees. On one plot of vines—three acres of Carbenet Sauvignon—field peas were sown, to be ploughed in later as green manure. The soil was scarified up and the peas sown at the rate of two bushels to the acre. The seed was drilled in with 2 cwt. of super per acre. The rainfall up to the end of April totalled 4·58 inches, distributed as follows:—January, 2·27; February, 0·13; March, 0·08; April, 2·10.

Inspection of Fruit and Plants.

During the month of May the Inspectors under the Vine, Fruit, and Vegetable Protection Act admitted 5,599 bushels of fruit and 68 packages of plants. The fruit, as usual, consisted almost exclusively of tropical fruits from Queensland. The exports consisted of 6,727 bushels of fruits, 88 consignments of plants, and 3,174 packages of vegetables. Of the above quantities 378 bushels of bananas were destroyed owing to being overripe, and 10 parcels of plants were detained owing to the absence of the necessary declarations respecting the absence of phylloxera from the gardens wherein they originated.

THE APPLE MUSSEL SCALE. OR OYSTER-SHELL BARK LOUSE

(*Mytilaspis pomorum*, Bouché).

By GEORGE QUINN, Horticultural Instructor.

During the last two or three seasons apples to which a few of these insects were attached have been occasionally observed in our markets. As far as could be ascertained these infested fruits had been brought from a few isolated spots in the wetter and cooler portions of the Mount Lofty Ranges. No evidence is at present forthcoming respecting the exact time of its introduction to this State, but the late Mr. Frazer S. Crawford, in his pioneer work on "The Fusicladiums and Other Insect and Fungus Pests," which was published in 1886, states definitely that "the colony is yet free of this pest."

As no organised attempt had been made up to that time to collect information in connection with these orchard pests, and Mr. Crawford's opportunities to indulge his great talent for such work were unhappily much curtailed by other duties, such a statement must, in the light of subsequent discoveries, be accepted with some reserve. The writer has a distinct recollection of procuring specimens—which the late Mr. Maskell, of New Zealand, identified as this insect—upon apple trees in the neighbourhoods of Clarendon, Stirling West, and Balhannah, about nine years ago. From the nature of its attack it was inferred that the pest had been present in each of these places for a good many years previous to that time. During the same season its presence was also noted upon many fruit trees in the cottage gardens in and around the town of Mount Gambier. In most of these places its identity as an insect had not been suspected, it being regarded as an excrescence on the bark, by those to whom it was pointed out. Enquiries as to whether it was found upon the fruits produced no satisfactory information, but at once indicated some slight difference in the breeding of the insect compared with its habits in colder countries.

This, then, is an introduced pest which, like most others we have, found an entrance into the State years before any system of plant inspection or disinfection had been resorted to by the authorities in South Australia. It is probably the most widespread of all scale insects which attack orchard trees, and, according to Professor L. O. Howard, the celebrated chief of the Division of Entomology of the United States Federal Department of Agriculture, it is found in all of the different divisions of the world where pomaceous fruits are grown. First recorded from Europe in the eighteenth century it is presumably indigenous to that part of the globe, but Professor Howard mentions an American account of it dating back to 1794, and expresses the opinion that this scale had probably been imported into America on nursery stock by the early settlers.

Although called the apple mussel scale it by no means confines its depredations to that fruit tree. Dr. Howard records its presence upon "apple, pear, quince, hawthorn, buckthorn, raspberry, bush currant, linden, hop tree, bladder nut, horse chesnut, maple, water locust, honeysuckle, ash, elm, hackberry, cottonwood, willow and poplar trees in the district of Columbia, U.S.A." From New Zealand, which is nearer home to us, the late Mr. Maskell reported its hosts to be "apple, pear, plum, peach, apricot, lilac, ash, hawthorn, sycamore, cotoneaster, and other plants."

It will thus be seen how wide are the chances of transmission being secured through the medium of the distribution of nursery stock, both on

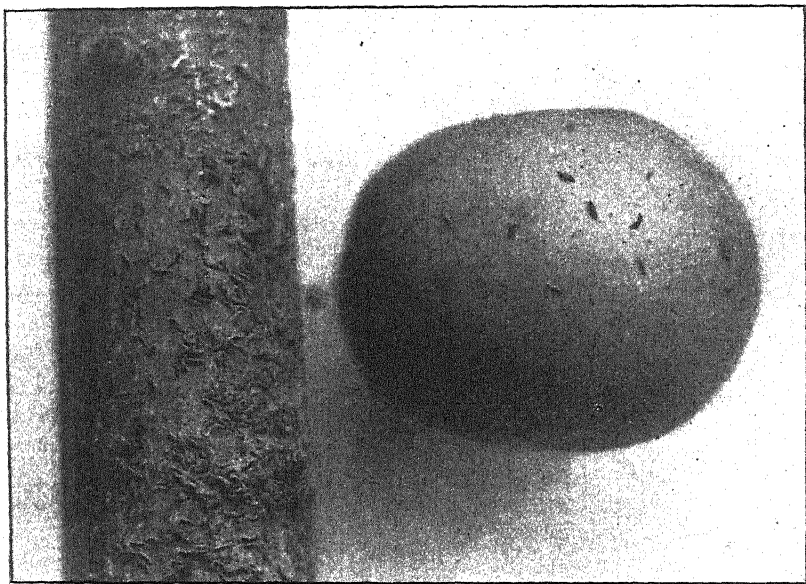
*a*

PLATE I.

b

Apple Mussel Scale (*Mytilaspis pomorum*)—*a*. Insects massed on bark of apple branch; *b*. Insects adhering to skin of an apple (both natural size), original.

ornamental as well as upon plants of economic value. Its distribution here through the medium of the fruits need not, to my mind, present a serious cause for alarm.

Although the detailed life history of this scale has not been worked out in confinement here, observations made respecting the varying stages in which the insect is found upon the trees at different seasons of the year indicate only slight differences which may reasonably be attributed to the climatic conditions.

If one of the "caraway seed" shaped shells, such as are shown sparingly on the apple, and more profusely on the limb, in Plate I., be lifted at this time of the year (May) small, whitish, powder-like bodies fall out.

These are the eggs, and if they are shaken on to a dark surface they shine with an opalescent smoothness. Viewed under a pocket magnifying glass of ordinary power they present regular elliptical outlines, and the contents give the eggs a colour and density of appearance resembling the partial opacity of milk when diluted with water. These eggs fill the larger portion of the cavity beneath the "scale," and, according to Dr. Howard, the number laid by one female may vary from 42 to 86. In the few local specimens examined by the writer the higher number has not been reached. In the smaller end of the so-called "scale" the shrivelled, but yet living, body of the parent insect is found. The shape given in Dr. Howard's figure, as seen on our Plate III., at fig. *e*, tallies exactly with local specimens of the female, as taken from her puparium. The eggs remain securely covered by this scale throughout the winter, but the mother insect shrivels up and perishes. When the warmth of the early summer time arrives and the trees have made a considerable growth of young twigs, these eggs hatch. The young scale insect which emerges is a very minute, whitish-yellow creature, with six legs, and equipped with a comparatively long sucking rostrum or beak, which lies folded upon its chest in company with several bristles or setæ. These are shown on the larva figured at *c* on Plate III. This small insect crawls out upon the young twigs, and, doubtlessly after much effort, succeeds in piercing through the bark to where the sap is freely flowing beneath, and then settles down to extract this liquid nourishment. When multiplied by thousands, even the infinitely small volume of sap drawn by such an insect must prove a considerable drain upon the energies of the tree. Some of the later individuals which hatch manage to ensconce themselves upon the developing fruits, but here, even on badly infested trees, the fruits with scales attached, up to the present, seem somewhat rare. Whether those found upon the fruits are belated members which have arisen from the winter eggs or early representatives of a summer and second generation, remains to be proved. Anyway, the shaded portions of the older limbs and the twigs are most attacked in this climate. As the fruits upon our apple trees are not prominent before the sun has attained great power, it would appear as if the solar rays had something to do with restraining the attack upon such exposed portions as the fruits. For the information of those who are not favourably circumstanced for procuring literature dealing with insect life it may prove interesting as well as instructive to explain briefly how this "carraway seed" looking "scale" is formed.

As will be gathered from the foregoing statements and from the accompanying plates, the so-called "scale" is not the insect, but only an inert covering or shelter under which it lives. There is no vital connection between the "scale" and the insect, such as exists between the bivalve from which it derives its common English vernacular name, and the shell it carries and manipulates with such dexterity. With the development of its shell the fish practically begins its period of independent mi-

grations in search of food; but, on the contrary, when the female insect forms its "scale" its locomotions are finished, and its feeding position finally defined. Neglecting slight variations, the process of growth is as follows:—In early summer the egg gives rise to the minute larva previously referred to. This in its turn crawls unobserved upon the bark and settles down to feed upon the sap. By such means it grows, and after a limited time casts its skin, which, however, adheres to the dorsal or upper portion of the body. From organs called spinnerets the insect secretes a waxy, fibrous substance, which sticks to the cast-off shell, and owing probably to the pressure due to the expansion and movements of

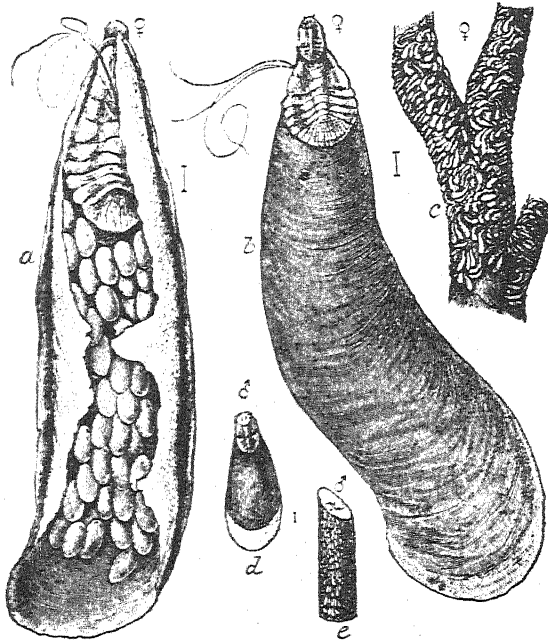


PLATE II.

Apple Mussel Scale (*Mytilaspis pomorum*)—a, Ventral view of puparium of female, showing eggs and parent insect; b, Dorsal view of same, showing skins shed at first and second moults on upper end; c, Insects on bark; d, Dorsal view of puparium of male insect, showing first moult at apex; e, Puparia of male insects on bark. The line on the right side of each figure indicates the natural length. (After L. O. Howard, in U.S. Department of Agriculture Year Book of 1894.)

the animal's body within, this "scale" like covering is moulded into the shape we see. In fig. b, on Plate II., the small, oval-shaped terminal point represents the shell thus formed by this moult and the subsequent additions of the secreted matter. With the casting off of the skin, the young insect sheds its legs and simply remains attached to the plant by its sucking rostrum and setæ or bristles. These latter are plainly shown in all of the figures of the female insect as depicted on our plates. If at any time the sheltering "scale" or pu-

parium, as it is technically named, be removed, the insect is readily brushed from its position, and must inevitably perish, owing to its helplessness. After a further period of growth the insect reaches maturity and again sheds its skin, but still remains beneath the shelter it affords. This second moult is seen in the second and larger oval plate with a scalloped surface, which is depicted near to the top of fig. *b*, on Plate II. The remainder and major portion of the caraway-seed shaped puparium is gradually formed by the accumulated secretions from the animal. The insect we have thus far described is of the female sex, but having now reached maturity the services of a male are necessary to secure fecundation. The egg and larval stages, *i.e.*, up to the first moult, are identical in male and

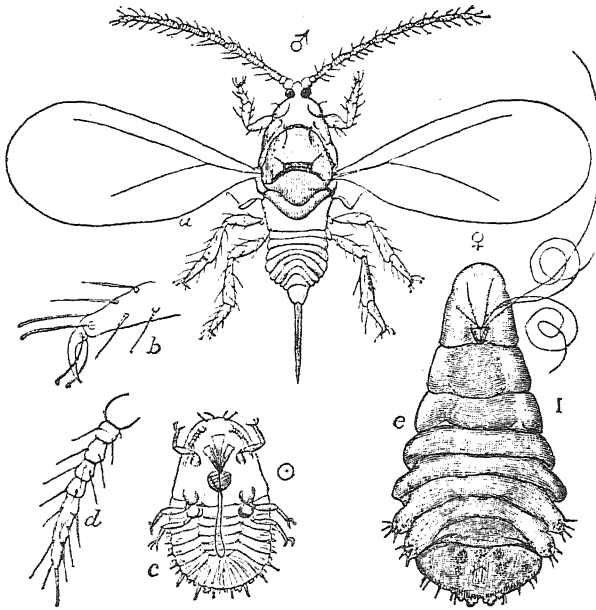


PLATE III.

Apple Mussel Scale (*Mytilaspis pomorum*)—*a*, Adult male insect; *b*, Foot of same; *c*, Young larva just emerged from the egg; *d*, Antenna of same; *e*, Adult female, as taken from the "scale" or puparium. All greatly enlarged, lines and dots on right side indicating natural sizes. (After L. O. Howard, U.S. Department of Agriculture Year Book, 1894.)

female; but, as the male, during the next stage, issues from the puparium as a winged insect, only one pellicle or shed skin is left behind in that structure. The puparium of the male not being required to shelter a large brood of eggs is not developed to anything approaching the size attained by that of the female. In figs. *d* and *e*, in Plate II., the somewhat regularly formed puparia of the male insects are shown, while in fig. *a*, of Plate III., the slender two-winged male is illustrated. The winged male insects of this species are exceptionally rare, or are seldom seen, as no record of their presence is forthcoming outside of the United

States. It may be mentioned incidentally that the winged males of nearly all the *Coccididae* are not only microscopic in size, but exceptionally swift in movement, and as they possess no organs for the reception or assimilation of food their mission is evidently of a very transient character. Hence the difficulty of securing specimens. Soon after impregnation has been effected the female prepares for egg-laying. In this species the eggs are extruded from the body into the concavity of the puparium until the space not occupied by the body of the parent insect is filled. The mission of the female is now fulfilled, and as the winter progresses she shrivels up and dies. This brief outline of its life history shows clearly that it is not the worn-out female that demands attention from the owner of the infested plants, but the destruction of the eggs in winter and the young larvæ in spring and summer should be his objective.

The question which naturally interests the orchardist as well as the student of natural history is: Why has this insect not increased more rapidly, seeing that it has been present in some South Australian orchards for upwards of a decade? As remarked at the outset, it is only during recent seasons the *Mytilaspis* has been in any degree noticeable upon the fruits found in our markets. It may be asked whether some parasite has not restrained it during former years, and more particularly when the use of poisonous spray washes was not so general as now. This supposition cannot at present be dismissed or upheld by any definite evidence, but it comes within the bounds of probability. Personally, the writer is disposed to believe that, like all other forms of life, this insect is slowly gravitating towards those localities wherein climatic conditions are congenial to its fuller development. All the world over, wherever the comparatively low temperatures have proved suitable to the growth of the apple tree, this insect, when introduced, proves a pest, and there is no reason to assume that the cooler portions of this State shall escape any more than do those portions of Victoria and Tasmania where the mussel scale is a factor with which the fruitgrowers must reckon. It is very questionable whether in the drier, open country found in the Barossa, Clare, and Wirrabara fruit belts, where the summer temperatures are so high and dry atmospheres prevail, this insect would ever reach alarming proportions, as such conditions are restrictive upon most of the *Coccididae*, more particularly when they are in the larval form. In the cooler regions, however, of the ranges near Adelaide and in the South-Eastern portion of this State the fruitgrowers would act wisely in following a policy of care as far as it is concerned. In southern Tasmania it is dreaded more than the codlin moth, and strenuous efforts are being put forth to reduce its ravages.

There are many remedies known which will destroy this pest, but the profitable application of some of them is impracticable under our conditions. As described before, this insect lives by the absorption of the juices of the tree, and these are drawn up through its sharp ros-

trum. It has no organ through which it could possibly take in any solid matter, consequently no poisonous remedy spread upon the surface of its food plant can prove effective as a preventive. It is obvious, therefore, that all remedies, apart from removal by actual force, must act upon the *Mytilaspis* either by suffocation or corrosion, or both. By the former method the insect is killed owing to the entrances to the breathing tubes in its body—through which the blood is oxygenated in all insect life—being closed. In the latter, death is caused by reason of the tender skin of these animals being readily destroyed by the action of any corrosive or caustic substance. *In either case, when dealing with a sucking insect, the antidote must be brought into direct contact with its body.* Where only a few trees are grown, the old remedy of scraping away all dead bark and then brushing over the trunks and limbs with fresh limewash, or with a solution of caustic potash, during the winter, will reduce the pest. In large plantations, however, remedies which can be applied in a wholesale manner with mechanical aids alone are practicable. Of these, spray washes applied by means of a good strong spray pump have thus far proved most reliable. At present the writer is not too confident of the value of the gas tent and hydrocyanic acid unless used in the summer, when these insects have pretty well all hatched out. The results of some fumigation experiments made upon fruits with the egg-carrying puparia upon them were not as conclusive as could be desired in securing the destruction of the eggs, but if there be a period of the year when no eggs exist outside the bodies of the females, then the gas tent treatment undoubtedly would do for this pest all that it does for the *Aspidiotus* scales upon citrus trees.

The spraying compounds recommended by those who have put them to test are:—

1. Lime, sulphur, and salt wash.
2. Resin compounds.
3. Kerosine oil emulsions.
4. Red oil emulsion.

The following are the formulæ and methods of manufacturing these remedies:—

LIME, SULPHUR, AND SALT.

Take:—

- 40 lb. freshly burnt quicklime
- 20 lb. sulphur
- 15 lb. crude salt

Place the 20 lb. of sulphur with 10 lb. of lime into a boiler containing enough water to cover them. Boil for about $1\frac{1}{2}$ hours, stirring the mass at frequent intervals. By such time the sulphur should be dissolved, and the liquid have assumed a dark amber colour. Next place the remainder of the lime (30 lb.) into a barrel and slake it with hot water, and whilst it is slaking add the salt. When the salt is dissolved, transfer the contents of the barrel into the boiler and keep the whole boiling for

about half an hour longer. Then add enough water to make 60 gallons of wash. *This wash may only be applied when the trees are leafless and dormant.* The operators should oil their hands and faces well before starting to spray, and gloves must be worn by those using the hoses. This spray is a good insecticide, a fairly good fungicide, and will very effectively kill all mosses and lichens growing upon the trunks and limbs of the trees

RESIN COMPOUND.

There are several recipes for resin washes, but the following is recommended as proving more satisfactory in destroying eggs of insects:--

20 lb. common resin

6 lb. caustic soda (98 per cent. strength)

5 lb. softsoap or $2\frac{1}{2}$ pints of fish oil

Place the soda into a boiler with about 10 gallons of water, and dissolve it by boiling. Then add gradually the crushed resin and the soap or fish oil in small quantities, stirring all the while. Boil for about one hour, by which time the liquid should resemble strong tea in appearance, and all of the ingredients should be dissolved. Dilute to make 80 gallons of wash. This wash may be applied without injury to the trees either in winter or summer. *It should not be used in early spring upon very tender foliage, neither should it be applied during summer if the trees lack moisture around their roots.* It runs through the hose and nozzles best when slightly warm, and if the water used in diluting the stock solution be warm, separation or precipitation of the resin is avoided.

KEROSENE OIL EMULSION.

2 gallons kerosine

1 lb. common soap

1 gallon soft water

} or 1 gallon of sour milk

Put the water, in which the soap is sliced and dissolved, into a boiler. When this is boiling, add the kerosine, and if the fire be confined, *i.e.*, not passing around the boiler, put the kerosine into the vessel of soapy water and boil it for a few minutes. Then agitate the whole with a syringe, force pump, or, better still, in an old churn, for about a quarter of an hour, until it thickens into a creamy mass, which on cooling has a jelly-like appearance, and will not leave an oily or greasy effect on glass. Where an open fire is used, the boiling soapy solution should be lifted off the fireplace to add the kerosine, and then, where no churn is available, the whole should be agitated by being transferred as rapidly as possible backwards and forwards, from one bucket to another, through the syringe or force pump. When sour milk is used instead of soapy water, the milk is brought to boiling point before the kerosine is added. Then the process of manufacturing is identical with the above.

The emulsion will keep in this form, and may be diluted as required for use. A gallon of this emulsion could be added to from 10 to 15 gallons of soft water to make a spraying solution. *The stronger form should be used in the winter when the trees are bare, and the weaker in the*

summer, when the foliage has emerged. Two applications, as directed above, have proved very effective for this pest in other countries.

RED OIL EMULSION.

This emulsion, as used in Tasmania, where the *Mytilaspis* is more troublesome than in any other State of the Commonwealth, is reported, on the authority of Mr. A. M. Lea, Entomologist to the Government of Tasmania, to be effective when made and used in the following proportions:—

Take—

- 1 lb. common soap
- 1 gallon red oil
- 1 gallon soft water

Dissolve the soap by boiling it in the water, then add the red oil as in making kerosine emulsion, and emulsify by agitation in the same manner as when preparing kerosine emulsion. Dilute for spraying by adding 14 gallons of soft water, making 16 gallons of spray wash ready for use. *This emulsion must be carefully prepared, and it may be used with perfect safety only upon the trees when they are quite dormant.* Mr. Lea pronounces it to be a most valuable remedy for this scale, but considers that even in Tasmania it should not be applied to the trees later than August, *i.e.*, before the scaly coats of the winter buds begin to relax. Here, then, we should cease to apply this emulsion at least three or four weeks earlier. When in Tasmania last year I heard much in favour of this preparation from the growers who had actually used it against the mussel scale, but evidence was not wanting of the injury resulting from its somewhat careless use in a few orchards.

In conclusion, one must urge upon growers that wherever these (or any other remedies for orchard pests, for that matter) are used, the work must be done thoroughly and intelligently, as half measures bring only disappointment and loss, not only of time, materials, and fruits, but of the desire to fight against such troubles. Don't apply the expression, "It's good enough" to anything which fails to possess the very best effort at your command.

PICKLING OLIVES.

By H. E. LAFFER.

It is such a common sight to see olive trees bearing large fruit which is rarely put to any profitable use that a few notes on the making of pickles might be useful to many. The fruit may be pickled either green or ripe, according to the taste of the consumer.

The ripe fruit is the more nutritious and digestible, but the unripe fruit is the more popular. Only large fruit should be treated, and it

should be graded evenly, to get the olives of a uniform size. Care must be exercised in gathering in order to avoid bruising or otherwise damaging the fruit. The first operation is to extract all the acrid, bitter taste, and when this is accomplished the pickling is completed by putting the olives into brine.

In order to determine the best methods of pickling olives, exhaustive tests were carried out at the Californian College of Agriculture. The results were given in a pamphlet printed in 1901, and I give the two most suitable methods recommended by the College authorities. The "lye" used for extraction of the bitterness was caustic potash. This may be obtained from any chemist, and the purer it is the better. It may be remembered that, roughly, $1\frac{1}{2}$ oz. of lye dissolved in one gallon of water makes a solution of 1 per cent. The pickling should be done in jars, and the olives kept submerged by means of a floating piece of board. In treating the ripe fruit, it will be found advantageous to use salt in conjunction with the lye right from the start.

TO PICKLE RIPE FRUIT.

Cover the olives with a solution of $1\frac{1}{2}$ per cent. lye and 2 per cent. salt, and let them remain for twenty-four hours. If bitterness is gone, or almost so, rinse in clean water and allow to remain for about four hours. If still bitter replace in fresh lye and salt. Then put the fruit in a 2 per cent. brine for twenty-four hours, when they should be placed in fresh brine for another day. After this, leave them in 3 per cent. brine for three days; in 4 per cent. brine for three days; in 6 per cent. brine for three days; in 8 per cent. brine for 21 days. Finally place the fruit in bottles, cover with a 12 per cent. brine, and seal the bottles.

It was found that by placing the bottles of fruit in water and heating them up to 80° C., or 176° F., the olives were much improved, and kept far longer than those not heated. Again, after being in 12 per cent. brine for a week or so, it was found that by pouring off the brine and replacing it by clean water, and heating as before, the olives were much improved on account of the water extracting some of the salt from the fruit, thus rendering them more palatable. An analysis of the brine showed a strength of only 5 per cent. salt.

TO PICKLE GREEN OLIVES.

Place the fruit in 2 per cent. lye solution for three to four days, until the bitterness has disappeared. The fruit should retain its bright green colour. Then place in 2 per cent. brine for one day, following with 4 per cent. brine for two days. Then 6 per cent. brine for three days, and 8 per cent. another three days. Finally, use a brine of 12 per cent., and bottle the olives. No heating is done, as in the case of the ripe fruit, but the brine should be well boiled and allowed to cool before using for bottling.

CIDERMAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 581.)

TAINTS OR DISEASES OF CIDER. OILY CIDER.

In 1898 a large quantity of cider in bottle became thick, so that it would pour out like oil, yet not so thick as to be what is termed in milk ropy. Hence we have termed it oily cider, though undoubtedly it is a species of ropiness. Oily cider, also called ropy, stringy, slimy, etc., is known in all cider-producing countries. The French term the complaint *graisseage*, the Germans *schleim bildung*.

The substances formed in the cider which give it this thick character are known to scientific men as mannite and gum, and are produced out of sugar. Hence the greater the proportion of sugar in the liquid the greater the quantity of these two substances which may be produced. As cider is usually filtered and bottled when it has a Sp. Gr. of 1.015 to 1.020, it contains far more sugar than the cider which is kept in cask, which is generally filtered only after the Sp. Gr. has fallen to 1.010. Therefore, it is in bottled cider that the trouble is generally most marked. When the same cider has been partly bottled and partly left in cask, that in bottle has been distinctly oily, while that in cask has shown only a slight oily tendency.

The three questions to which an answer must be sought when investigating such a trouble are:—(1) What is the cause of this oily cider? (2) How does the cause get into the cider? and (3) Can the oily nature be cured?

1. The cause of oily cider, given by practical writers, is varied. Some say it is due to: (a) heat; (b) the use of frost-bitten apples; (c) want of cleanliness in the casks; (d) want of tannin in the juice, etc. Those who treat the subject more scientifically say that it may be produced (e) by a special kind of yeast; (f) by aerobic bacteria; and (g) by anaerobic bacteria, or those which cannot live in the air. Let us now examine these supposed causes *seriatim*: (a) Heat. Those who put it down to the heat of the summer mistake for the actual cause what is only an augmenting influence. The same heat will be felt in many cider cellars, and even greater heat in some seasons, and yet there will be no oily cider. In years gone by heat was supposed to be the cause of many chemical changes which are now known to be brought about by micro-organisms. The reason why such changes are more pronounced in a warm season than in a cold is due simply to the fact that warmth promotes the growth and activity of micro-organisms, and so increases the amount of chemical change which they bring about. (b) The use of frost-bitten apples; and (d) want of tannin in the juice, have been proved not to be the causes at Butleigh; and (c) want of cleanliness in the casks is most unlikely, as will be seen subsequently.

That it is due to some living cause is well shown by the following experiment: The sediment from a bottle of oily cider was collected and placed in a bottle of good cider. Two months after this cider had become oily. This experiment shows how very necessary it is, when any trouble arises, to completely destroy, and not to leave in, or even near, the cider house, that living bacterial matter which, in the form of sediment in bottle or cask, may, if disseminated, cause a veritable epidemic of the complaint to which it can give rise. Pasteur found that some oily or viscous wine was caused by a bacterium, which, as it consisted of little spheres, having the habit of growing in chains, we should term a streptococcus. In many samples of oily cider, even after the most careful examination, I have been unable to find any streptococci or even cocci, so that in cider the change appears to be due to some other organism. It has not been my good fortune to discover any exact description of either a yeast or any bacterium which would produce oily cider, and until these have been discovered, thoroughly studied, and most accurately and minutely described, it will be quite impossible to discover whence such yeasts or bacteria come, how they get into the cider, or how they are to be guarded against. It is a remarkable fact that while oiliness in milk and beer is known to be produced by many organisms which Lafar has described in his "Technical Mycology," this author writes:—"With regard to the ropiness of cider, the most frequent malady to which this beverage is subject, nothing reliable can at present (1898) be reported."

(2) Putting aside for the present a consideration of what is the nature of the organism which produces this oily cider, we come to the second problem, how did it get into the cider? The numerous suggested origins of the trouble have been tested one by one with all the care and thoroughness possible, and yet we are not in a position to say definitely whence it comes. Let me give some illustrations of the work which this has entailed. The oily cider was first markedly noticed in some which had been blended to obtain a liquid specially suited for bottling. For this purpose of blending, Mr. Neville Grenville had obtained some large barrels which, after being most thoroughly cleaned, were well waxed with paraffin. Was it the paraffin, was it the new barrels, or was it a constituent of the blend which had caused the oiliness? Experiments were made with paraffin in fermenting apple juice and in old cider. Neither had any effect on the paraffin, nor did the paraffin affect the cider. The history of the barrels was most carefully investigated, and it was found that they had not previously contained oily cider, or cider which subsequently became oily. Nor could any evidence be obtained to show that it was due to the blending. Subsequently two very oily samples were discovered, neither of which had been near paraffin nor in new casks, nor blended, thus finally disposing of our three assumptions. Some blends which contained small cider were oily, and it was thought to be due to the small cider, but this hypothesis was found to be untenable. The cider is bottled at Butleigh in patent

screw-stoppered bottles, so that it might have been due to the bottles or stoppers becoming contaminated. It so happened that Mr. Neville Grenville had allowed a neighbour to have some cider and to bottle it himself in ordinary corked wine bottles. Fortunately, this cider was not all consumed, and the remaining bottles were sent to me. The cider was oily. Thus the bottle theory was disposed of. The fact that this cider had been bottled at Butleigh seemed to indicate that the atmosphere in the cellar was contaminated. On a careful examination of the records it was found that some cider was bottled on the 27th July, and another barrel was bottled the next day, the 28th July. That bottled on the 27th was very oily, while that bottled on the 28th was excellent, and had no sign of oiliness. It is scarcely possible that any climatic or other conditions could so affect the atmosphere of the cellar as to render it one day capable of inoculating all the bottles with the microbe which produces oily cider and the next day to be free from this microbe.

Such are a few of the attempts to solve this perplexing problem. After full consideration of the results so far obtained the only possible causes that seem left are:—First, that the apples themselves were contaminated; or, secondly, that the water used for washing the bottles and barrels at Butleigh may be liable to contamination, though, as this water comes from good springs, it is hardly possible. There are, however, many facts which it is difficult to explain on either assumption, as, for example, why in such case all the cider was not oily.

Some experiments started in 1901 regarding flavour in cider were in 1902 concluded. It was then found that of three samples of cider made from distinct varieties of apples one was oily. This fact strengthens an opinion which has for some time been present in my mind, that the cause of oily cider is an organism or organisms growing upon special varieties of fruit under special conditions of climate. Among the samples of oily cider which were kindly sent to me during 1900 was one showing the trouble to a very marked extent. This, after repeated microscopical examinations, appeared to contain only one variety of yeast, present in very small quantities, and three varieties of bacteria: (a) the most numerous was a very large, long bacillus; (b) less numerous was a very thin, fairly long bacillus; and (c) was a large micrococcus.

The first experiment made was to place a portion of the cider into a clean, sterile bottle and shake it well up with the air; the gases given off from the cider were driven out of the vessel with a current of air, and the cider was again well shaken. Having repeated this operation several times, the cider was found to lose its oily character and became as limpid as ordinary cider. This experiment seemed to confirm my former work, which showed the change to be due to anaerobic organisms.

To check this, several plate cultures were started, each well seeded with the cider, and in varying proportions. A few yeast colonies grew on the plates, but none of the bacteria. There were one or two colonies of

bacteria, but when the organisms were examined under the microscope they were quite distinct from those present in the cider, and were probably air contaminations, unavoidable in all bacteriological work, especially when carried on in the contaminated and dust-laden atmosphere of the City of London. Attempts were then made to grow the organisms in an atmosphere of carbonic acid gas. At first it seemed as if the work would prove futile: but after waiting for five or six weeks, some growths were visible on cider solidified with agar, and kept hermetically sealed in a moist chamber filled with carbonic acid gas. All these growths have been studied: and when sufficient material was obtained they were taken to Butleigh, and freshly filtered cider was inoculated with the various cultures and with mixtures of these cultures, for it is quite possible that this complicated change in apple juice may be brought about only by a combination of two or more of these organisms.

It may be that cider ordinarily contains constituents which inhibit the growth of the culpable yeast or bacterium, such, for example, as the presence of tannin in such quantity as is ordinarily found in the juice at Butleigh. In some samples of oily cider the yeasts have been more numerous, as also the varieties of bacteria: and in one sample no organism similar to the three above-mentioned could be discovered.

(3) The remedies for oily cider which have been proposed are numerous, but have little scientific foundation. Racking into a freshly-sulphured cask, adding glucose, cream of tartar, and pure yeast, re-fermenting, racking, etc.; adding tannin: cachou: crushed mountain ash berries: broken gall nuts; alcohol; Spanish earth; and aerating the cider, have all been suggested by various writers. It is said by some makers that if left for a time the cider will lose this oily character. Whether this were so or not could easily be proved, for which purpose bottles of oily cider were put aside. But the longer the cider was kept the worse it became.

The result of some laboratory experiments convinced me that by aerating this cider it would lose its oily character. This aeration was easy to obtain on a small scale, but how to do it on a large scale was another problem. After full consideration, the following experiment was made:—The pomace from a cheese was carefully broken up and placed in a large open tub, the bottles of oily cider were emptied on to the pomace, the contents of the tub were well stirred, and after standing for twenty-four hours the contents were placed in the press and repressed as for the manufacture of small cider. The juice which came from the press had nearly lost its oily character. It was placed in a barrel to ferment, and partly lost the oily character and peculiar taste it formerly had, and subsequently turned out very fair draught cider. But it was not a good cider. The oily or slimy fermentation imparts to the liquid an unpleasant flavour which cannot be entirely got rid of. This investigation serves to show how difficult are the problems relating to cidermaking which science has to solve, and how necessary it is, if

any lasting progress is to be made, for such experiments to extend over the whole year, and not be confined merely to the three months of cider-making.

SICK CIDER.

I have nearly always found that sulphuretted hydrogen was present in, and given off by, "sick" cider, which is cider having an insipid and unpleasant taste and aroma. Whether this peculiar disease or taint in cider is due entirely to this sulphuretted hydrogen or not has yet to be determined, but it seems probable. This gas is sometimes produced in the fermenting juice soon after it leaves the keeve. At other times its formation appears to be delayed until a later stage in the fermentation.

One cause of the gas being produced in the fermenting cider was soon discovered. The juice was fermenting in casks which had been "matched," *i.e.*, had sulphur burnt in them for an experiment, it not being usual to do this at Butleigh, as it is in some districts. Sulphur when burnt is converted into an oxide (sulphur dioxide), which is absorbed by the juice; and probably the yeast, in its avidity for oxygen, decomposed this substance, robbing it of oxygen, and causing the sulphur to combine with hydrogen, thus forming sulphuretted hydrogen. This fact is of some practical importance. The object of matching cider, a custom still much in vogue, is to prevent fermentation. It seems evident from the above statements, which have been amply proved by experiment, that unless care be taken to obtain the cider in such a clear condition that the matching is likely to prove efficacious, it will not only fail in its object, but will also destroy the quality of the cider.

WHAT IS GOOD CIDER?

Having carefully considered the method of manufacture, the nature of fermentation, and some of the troubles of cidermakers, we may now ask—What is good cider? The essential conditions of good cider, placed in the order of their merit or importance are: first, flavour; secondly, good appearance, which includes both colour and clearness; and lastly, keeping quality. How to obtain these conditions has been the object of the experiments at Butleigh. To obtain flavour it is well known that first and foremost the introduction into the juice of any substance which would impart an unpleasant flavour thereto must be prevented. The various means which have been adopted to ensure this end have been described. If perfect purity of the juice could be ensured, then it becomes evident that the flavour of the resulting cider would depend either upon the original flavour of the apples or apple juice, or upon changes which had taken place during fermentation.

The flavour doubtless depends to a certain extent upon the original flavour of the apples, for if cider is made from one variety of apple only, and if this has a special, distinct, and marked taste of its own, such, for example, as the Foxwhelp, this flavour of the apple will be present in the resulting cider. Evidently, then, the flavour of other varieties of

apples which may not be so marked must still contribute to the flavour of the resulting cider. These flavouring compounds form an infinitely small part of the original juice, and their true flavour only becomes marked when all the sugar has been converted into alcohol. Even then they are to a certain extent masked by the other constituents present in the juice, as, for example, the acid, but when both acid and sugar are present they are considerably hidden. On the other hand, a small percentage of sugar and of acid appears to enhance the good flavour. This is the reason why cidermakers are anxious to leave in the cider a certain amount of sugar.

Probably the most difficult task of the cidermaker is to retain in the juice this small amount of sugar, or, as it is often called, "sweets." Unfortunately, the desire to do so has outweighed all other considerations with some makers, more especially in Devon and Hereford, and, as often happens with things which are good in moderation, this desire having been carried to excess, has produced a greater evil than the one which it was originally intended to counteract.

Those who study these investigations into the manufacture of cider will find how to retain sufficient sugar in the cider without having it too sweet or needing to have recourse to preservatives. The tannin will also affect the flavour. But probably of most importance as affecting flavour are the extractives or non-fermentable substances present in the juice; and if these are in excess they will so cover the flavour due to fermentation as to materially lessen the value of the resulting liquid. The influence of these non-fermentable constituents was first noticed in 1896. It was considered somewhat remarkable that, in the opinion of a great number of those who tasted the cider made in that year, the small cider was preferred to the cider produced by the fermentation of the whole juice. After a careful study of all the facts, it seems reasonable to conclude that this was due to the smaller quantity of non-fermentable constituents present in the small cider.

Experiments were started to test this view. Some apple juice from windfalls was fermented as usual in one barrel, while a portion of similar juice was diluted with one-half its own volume of water, by which the non-fermentable constituents would be greatly reduced, and sufficient sugar was then added to make the liquid contain the same amount of sugar as the whole juice. The result was a better cider from the diluted juice than from the whole juice. It is probable that the amount of these non-fermentable constituents depends, partly upon the season, partly upon the variety of apple, and partly upon the care which is taken in the management of the orchard; but, considering their importance, it is evident that their further investigation will be necessary. As the amount of sugar, acid, tannin, and extractives varies in every sample of cider, it is evident that uniformity cannot be easily obtained in a bulk of liquid, unless some means exist for blending the juice either before or

after fermentation. Experiments which have been made at Butleigh prove that, as a rule, blending the juice improves the quality.

Another factor which plays an important part in the production of flavour in cider is the nature of the fermentation. This has been proved by the experiments with pure yeasts. The results of experiments showed that, to some extent, the flavour varied according to the character of the pure yeast employed. That made with yeasts obtained from grapes had a distinctly vinous flavour. That made with yeast originally taken from the Kingston Black apple had a slight flavour of the Kingston Black apple, but only very slight. That made with a pure cider yeast had more of the flavour of cider, or perhaps it would be better to say did not bring into the mind the idea of any flavour other than that of cider. But in spite of these slight differences, there was an undoubted similarity between all these samples, and this I attributed to the flavour of the original apple juice.

It seemed to me, however, that neither the aroma nor the flavour of the cider was present in the original apple juice. The apple juice has, of course, a flavour and aroma of its own. But watch the juice as it ferments; the flavour, which is largely due to sugar, gradually disappears, so also does the original aroma. Indeed, if from accident or for experimental purposes the juice be allowed to ferment to dryness, both flavour and aroma have gone. Such a dry cider will contain (besides water) alcohol, a little malic acid (which is the acid present in the apple juice), some mineral matter, tannin, and about 1 to 2 per cent. of other substances—extractives. To what, then, will it owe its flavour? Partly, perhaps, to the malic acid, but, so far as is known, none of the other substances give it any special flavour. Some think that the flavouring matter present in the apple remains intact in the cider, and that the flavour will depend mainly, if not entirely, upon these substances. To a very slight extent only is this true. I remember full well the first time I ever tasted such nauseous liquid, for no other word adequately describes it. I said to the men, "Well, that is useless; it might as well be thrown away." I shall not easily forget the amused smile of contempt and the look of superior knowledge which came into the foreman's face as he said, "Law, sir, that'll come to hisself in time." And it did, many months after, though rough, dry, and sour, possess an aroma and flavour which would justify one saying it was not such bad cider, as cider then went. I could not help comparing the difference to that which exists between curd as it is vatted and the ripe cheese obtained months afterwards. The absence of all aroma and flavour from juice which had just fermented to dryness convinced me that the aromatic and flavouring constituents subsequently formed are the products of a fermentation quite distinct from the mere formation of alcohol which first takes place. When, then, are they formed?

When matured cider is gently distilled, certain volatile aromatic compounds, probably ethers, having in a concentrated form the same

bouquet as the cider itself, pass over with the alcohol. In order to determine when these substances were produced, the juice as it came from the press, and the same juice at intervals of a fortnight, was distilled and all the distillates were kept. These were subsequently compared, and it was found that no flavour or aroma was present in the distillate from the juice; that at each stage of the fermentation the aroma became a little more marked, but that no flavour could be found in the distillates until the cider was filtered. While it then showed marked aroma the flavour was only slight. These changes and the production of aroma and flavour are most marked in cider which has been in bottle for a long period. If, therefore, they are brought about by organisms which have been growing in the cider, these should be found in the sediments which are formed in the bottles. A number of such sediments have been examined, and permanent preparations made thereof. These sediments at first are composed mainly of yeast cells; subsequently they are composed mainly of bacteria. Hence, that the yeasts are alone instrumental in producing the aromatic and flavouring compounds is, I think, doubtful.

What part the bacteria play we know not; but we seldom find organisms present in any produce which are not actively engaged either for the benefit or the injury of that produce. Hence, as I am referring now to cider of the best quality, we must assume that these bacteria play an active and beneficial role in the ripening, if I may use the word, of that cider. Bacteria, therefore, appear to be the main cause of the ripening of cider; of those changes which are generally designated as secondary fermentation. But the amount of gas found in these bottles of cider, and the diminution of the sugar contents of the juice, indicate plainly that changes produced by yeast must also have taken place. What, then has finally become of the yeast cells? Are they disintegrated? And by their disintegration have they contributed to this flavour production? Or have they supplied foods for the bacteria? All these questions need to be answered. The questions: What are these bacteria? Are they alike, are they different; are some capable of producing one flavour, others of producing another flavour? raise problems of still greater importance, which have yet to be investigated.

COLOUR.

We may now pass to a consideration of appearance. The cause of the colour of the cider has been experimented upon. It depends partly upon the natural colour of the apple juice, partly upon the freedom of this juice from extraneous substances—as, for example, the juice of rotten apples—and partly on the treatment of the pomace after it leaves the mill and before pressing, for if then exposed to the air it gets darker and the resulting juice is more highly coloured. As we do not believe in highly coloured juice, precautions are taken to prevent all these sources of high colour.

Clearness is more difficult to obtain, especially with cider in bottle. It can be obtained in bottle by disgorging, as is done in the wine industry; but the cost of this process would be prohibitive. It is easy to obtain a dry cider in bottle without much deposit, provided the juice is placed in the bottles immediately it comes from the filter, and is not filtered until nearly the whole of the sugar has been fermented. There is a general opinion that sugar candy will not ferment if placed in the juice at this time, and experiments were made to determine how far this assumption was correct. But the sugar candy will ferment. That a certain amount of fermentation should proceed in the bottle is necessary to give the cider "life," and the difficulty up to the present has been to obtain this "life" without too much deposit. The value of the filter as a first means of obtaining a clear juice has been so amply demonstrated that nothing further need be said on the subject. The want of a cheap filter still exists, and any one who will turn his attention to the production of both a cheap and effective filter for cider will undoubtedly reap a rich reward.

Lastly, as regards keeping quality. It has been found at Butleigh that if care is taken in obtaining the juice free from impurities in the first place, if the fermentation of the juice is carefully watched by means of the hydrometer, and, while allowed to proceed far enough, is yet not allowed to proceed too far before filtration takes place, and that if subsequently the barrels are kept air-tight, the cider not only keeps well, but improves in quality by keeping. If the juice is allowed to ferment dryness before it is filtered, so that no subsequent fermentation takes place to restore life to the cider, it will be far more difficult to keep.

WHAT KIND OF CIDER DOES THE PUBLIC WANT?

The great want of cider drinkers, especially of those who are taking it under medical advice, is a "dry" cider. Some would appear to desire an "extra dry" cider. I do not see how they are to obtain such an article unless they are prepared to pay a much higher price for it than they seem willing to do at present. The production of an extra dry cider of good quality is almost as difficult as the production of an extra dry champagne. If consumers would recognise this, and be willing to pay a fair price for the skill required in its production, there are, I am sure, many cider manufacturers who could, and would, make it. But one might as reasonably expect to buy champagne at the price of claret as "extra dry" cider at the price of the ordinary sweet draught produce of the country. Some cider merchants say that the majority of cider drinkers want sweet cider. This being comparatively easy to produce, is therefore likely to remain the chief product of cidermakers. But other merchants inform me that the growing demand is for a dry cider, and that, too, is my own opinion; hence, it seems certain that the introduction of good dry cider would well repay any maker who would put it upon the market.

By careful attention to the information contained in this report, such dry cider can be made, though necessarily with more trouble than is requisite for the production of a sweeter liquid. In the future three brands of cider ought to be made, "A," extra dry, that is containing not more than 2 per cent. of sugar; "B," dry, containing under 4 per cent. sugar; and "C," sweet, containing over 4 per cent. sugar. But it is worth bearing in mind that 5 per cent. of sugar represents one ounce of solid sugar in every pint of cider, and those who like "sweet" cider should realise this fact. It may account for much of the evil effects sometimes attributed to cider drinking. There is this advantage about dry cider. It contains more alcohol and less sugar than ordinary cider, and, is, therefore, far less liable to "go wrong." The alcohol acts as a natural preservative, and the small proportion of sugar renders other changes improbable. The great difficulty is to prevent "acetification," and this can only be done by keeping the cider so that the air cannot gain access to it. The public taste has of late years gradually but markedly favoured "dry" wines. Place before the public a good dry cider and few would ask for wine. Landlords and tenants in cider-making counties should combine to develop the capabilities of this industry, and strive to retain for English agriculturists at least one source of income which the foreigner has not yet taken from them.

THE MILKING MACHINE.

By P. H. SUTER, Dairy Expert.

Every large dairyman knows, often to his sorrow, that the labour problem is the most difficult one he has to deal with. Hired labour is often difficult to obtain on a dairy farm, and sometimes is the reverse of satisfactory. The full development of the dairying industry in these States is, I am convinced, largely bound up in the solution of this problem. This factor in dairying has not been overlooked by those who make it their business to supply the wants of the dairyman, and various mechanical milkers have been placed on the market from time to time.

For many reasons the earlier types of these milking machines failed to give satisfaction, but the present Lawrence-Kennedy machine has evidently come to stay. These machines are being installed largely in the sister States, and, with few exceptions, they are giving good results. On many of the large dairy farms in Western Victoria they have been in constant work for some time. It is to the adoption of the Gillies patent teat cup that the success of the machine is largely due. This cup is a great improvement on the old form, but, in my opinion, the weight could be reduced with advantage.

The cost of installing the milking machines amounts to £30 each, to which must be added the cost of the boiler required to generate steam.

On many farms, however, boilers are used for other purposes, and but little extra outlay would be incurred in making the necessary connections. The largest installation of these machines in Australia has recently been completed on the farms of Mr. William Stephens, near Brisbane. After seeing the machines at work at the Hawkesbury Agricultural College, in New South Wales, and making full enquiries as to their effect on the cows, Mr. Stephens ordered thirty of them for his farms.

The illustrations accompanying this article show clearly the way the cows are secured and how the machine is operated. They also give unmistakable proof that the cows are quite at ease. Before the teat cup is

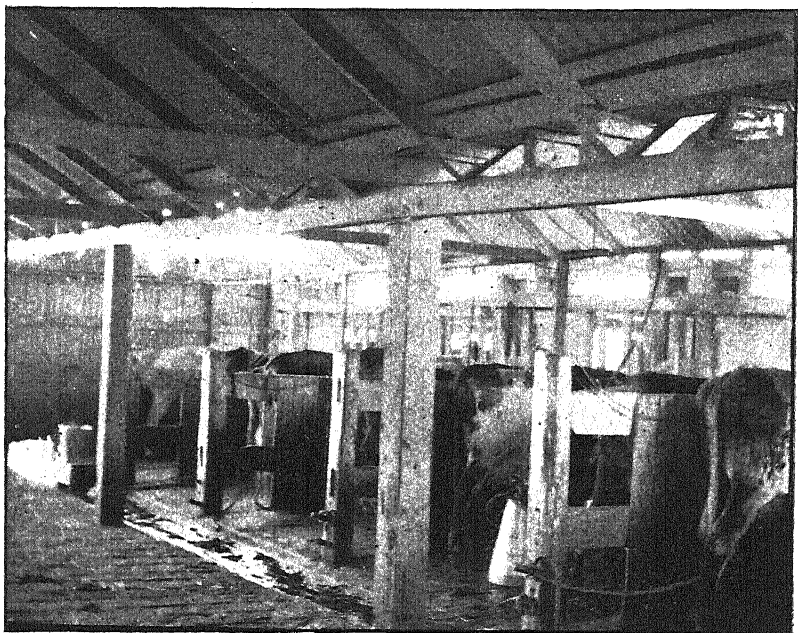


PLATE I.

Victorian Milking Shed, fitted with Lawrence-Kennedy Milking Machines,
with Gillies Patent Teat Cup.

attached, the udder of the cow is washed with clean water. The machine works with a 15 in. vacuum, which, on the admission of air through an intermittent valve, is partly broken, and the suction on the teat is released, the vacuum falling back to a 4 in. one, which is sufficient to cause the cups to retain their hold on the teats. One great advantage of the milking machine is that the milk is not exposed to contamination from injurious odours prevalent in the atmosphere of most cowyards, nor can hair or dirt from the cow's body or the milker's hands find an entrance. This, of course, means that the milk is comparatively free from those

organisms which are responsible for objectionable flavours, and which assist to bring about rapid decomposition of the produce.

I would not advise dairymen having less than thirty cows in milk to go to the expense of installing the milking machines, but, after some years' experience, I have no hesitation in saying that to the larger dairyman they have advantages. In installing a plant a fair thing would be to allow one machine to fourteen cows. The average capacity of the machine is seven to eight cows per hour, which is not equal to that of a good milker. Unlike the human milker, the machine will not kick or hit the cow. In no case have I found or heard of any trouble following their use, the cows, after calving, returning to their work sound in all quarters. Such is not always the case when the cows are milked by the hired labourer. Indeed, it is surprising to notice throughout the Commonwealth the number of cows with blind, useless quarters. This

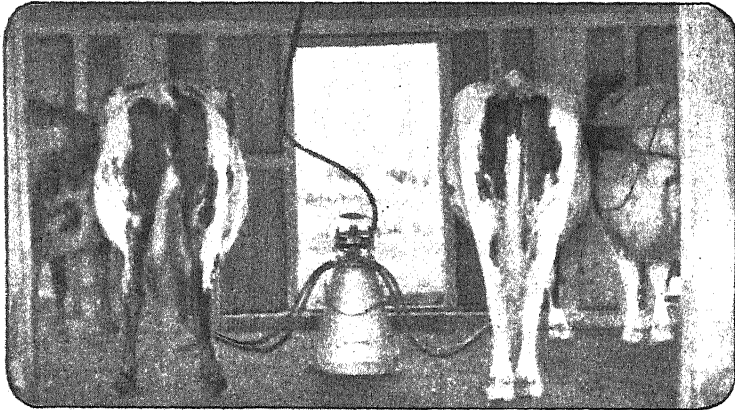


PLATE II.

Milking Machine at work on Valuable Ayrshire Cows, owned by Mr. Brisbane, of Gowie Park Estate, Victoria.

defect is largely due to imperfect or irregular milking, careless drying off, inflammation of the udder (mammitis), or to stocking of the udder for sale or show purposes. The latter practice is both cruel and injurious. Where cows are not stripped out and well dried off the milk may coagulate and form a small lump of curd at the top of the canal through the teat. This may block the passage and set up inflammation, with the consequent loss of the quarter.

The milking machines can be run by the women equally as well as by the men. It is often stated, and truly so, that they do not always strip the cows thoroughly, and the dairyman has in consequence a tendency to look with disapproval on them. But, may I ask, is it not a fact that one of the greatest troubles of the large dairyman is that his milkers are too often negligent in this respect, and require constant super-

vision? I contend, therefore, that this is not a serious drawback to the milking machine; in fact, it is somewhat of an advantage, as the dairyman knows that it is absolutely necessary to strip the cows, while with the hand milker the owner's confidence may be misplaced, with the consequent loss of the richest milk and the probable injury to the cow. Failure to strip the cow also shortens the period of lactation. With heifers and young cows particularly this is a serious matter, as it is important to develop their milking capabilities to the utmost, and it is a

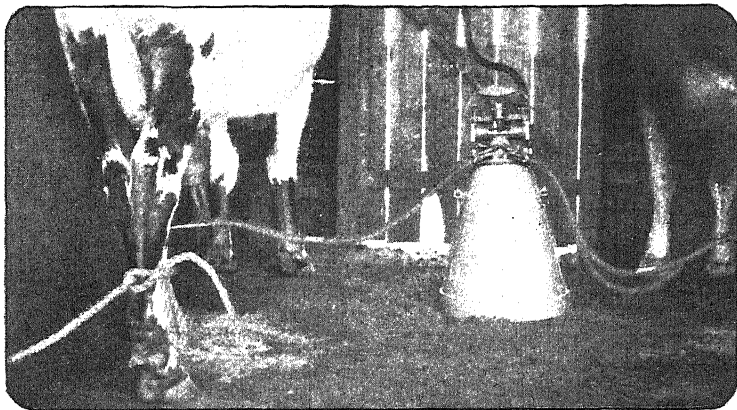


PLATE III.

Showing Gillies Patent Teat Cup.

manifest advantage to keep them in for nine or ten months, even if during the latter period they only yield a small quantity of milk daily.

The Lawrence-Kennedy milking machine is easy to clean, simple to work, does not readily get out of repair, will not injure the cows or cause sore teats, and, unlike the hired labourer, takes but little feeding. I may add that Messrs. A. W. Sandford & Co. have offered to instal at the Roseworthy Agricultural College Dairy one of these machines and to run it for a lengthy period under the supervision of the Dairy Instructor.

GARGET

(CONGESTION OF THE UDDER).

Garget is a disease of the udder usually affecting heavy milkers. It may occur at any time of the year, is not confined to any particular locality, and is not contagious. The udder being a very highly organised gland, any condition which affects the general health of the cow is very apt to involve this structure and show itself in the form of gargety milk. It frequently happens that a cow is affected with garget or gives bloody milk at more or less irregular intervals. Such animals should be examined by a competent veterinarian, as it is quite likely that the animal

has some special disease of the udder, such as tuberculosis or actinomycosis. In that event the milk would be considered unfit for food, even during the apparently normal condition of the animal, though it may look perfectly healthy. The germs might be present in the milk and transmit the disease to other animals using it. The presence of these germs in the milk could be demonstrated only with the microscope.

CAUSES.

Injuries (blows on the udder with stones, clubs, feet, or horns, from projecting nails, or edge of boards, sharp or cold stones); exposure to sudden and extreme changes of weather; over-feeding on rich food, such as cottonseed, peas, or beans; indigestion; sores on teats, or insufficient stripping of the udder; it also frequently happens that a newly born calf cannot drain the udder completely; overstocking of udder for an entire day or more, with a view to making a show of this organ for sale purposes.

SYMPTOMS.

Usually, the first that is noticed is the condition of the milk, which is watery, coloured with more or less blood, and containing a clotted, stringy substance (casein). This is frequently followed by a white, pus-like fluid, and, in many cases, a very offensive odour.

In Severe Cases the first symptoms to be noticed are first a chill, with horns, ears, and limbs cold. This stage, which lasts from a few minutes to hours, is followed by a period of fever, in which the horns, ears, and limbs become unnaturally warm, and the udder is hot, swells, and becomes more or less solid in one or more quarters. The muzzle is dry and hot; the temperature of the animal is raised, the pulse is full and rapid; the breathing is quickened. The cow has little or no appetite, and she does not chew her cud. The bowels are more or less costive. The amount of milk is lessened, and the flow may be entirely absent in the affected portion of the udder.

In Mild Cases many of these symptoms cannot be recognised, and the first ones noticed are the swelling, heat, and tenderness of the udder. If the trouble grows worse the tenderness causes the animal to straddle with its hind legs. If the cow lies down she will lie on the well side. The above troubles may disappear in a few days and the udder resume its normal condition. If not, it changes into a chronic form, in which the symptoms partially subside. The result is, the udder, or the affected part of it, becomes dry or forms abscesses. In the case of drying up the parts may become hard and remain so permanently, or only until the next time of calving. If abscesses are formed they should be opened by a competent person and properly treated. Should infection take place at any time (the entrance of disease germs into the affected part) the result may be serious, and may even cause the death of the cow.

TREATMENT.

The treatment will depend upon the severity of the case and the stage in which the disease is discovered. If the animal is cold, two ounces of ground ginger given in a pint of warm water, or any hot drink, may cut short the attack. This must be given from a horn or bottle. Blanket the animal and rub her limbs with wisps of straw, making her as comfortable as possible. Moist heat should be applied to the udder by using heated wheat bran in bags, held in place by strips extending over the loins, between the hind limbs, and around the abdomen.

Should the udder be very painful and the animal feverish, fomentations of hot water, as hot as the attendant's hand can comfortably bear, should be applied for several hours, for about fifteen minutes at a time. This may be done by passing a sheet around the body, with four holes cut for the teats, and soft rags or bran packed firmly between it and the udder. After the fever has subsided, drench the animal with one or two pounds (depending on the age, size, condition, and strength of the cow) of Epsom salts, with two ounces of powdered ginger, in a sufficient amount of water. When the purging has ceased, one ounce of saltpetre may be given daily. The udder will need constant attention for some time in the way of gentle rubbing with camphorated oil, several times daily; at the same time gently removing all the milk, by squeezing the teat instead of pulling or stripping it. If this causes the animal too much pain, a teat tube may be used, but must be boiled thoroughly for five minutes each time before using. When the udder is not tender, thorough hand rubbing several times daily, with or without the camphorated oil, will aid in bringing about a normal condition. ["Press Bulletin," No. 139, Kansas Agricultural College.]

DOES WHEATGROWING PAY? — A REPLY.

By F. W. COLEMAN, Saddleworth.

The publication in the March issue of *The Journal of Agriculture* of my estimate of the cost of growing a bushel of wheat on fallow land has caused much discussion amongst members of the Agricultural Bureau, and has also been criticised in the neighbouring States. I propose, therefore, to reply to the various criticisms that have come under my notice.

To arrive at the cost of wheatgrowing, or, indeed, of any field operation, it seemed to me necessary to know what it costs the farmer to send a man with team and implement into the paddock for a day. Given such cost as a basis the calculation becomes much simpler. I took as a basis the cost of a team of six horses with three-furrow plough, and, as far as possible, made my estimate from actual facts.

FEED.—The chaff was a mixture of sheaved wheaten and Cape oaten hay, mixed as cut; the long hay was wheaten, all clean, sound, and free from rust. I carefully weighed a number of bags of chaff and some score of sheaves to find the average weight. My horses were fed exactly as stated, that is, with 46 lb. of good hay and chaff per day. They worked well on that alone, and finished the fallowing in good condition. Such feeding may not be enough for some heavy draughts, perhaps not for Mr. Huxtable's, of Virginia; it was for mine—medium, nuggetty draughts. As to cost, the value of such feed was 36s. 8d. per ton, or 1s. 8d. above local price for best chaff at that time. The value of all foodstuffs varies, but 36s. 8d. on the farm I considered a fair average price. Hay may be dearer at Penong, or horses there need more.

DEPRECIATION.—*Team and Harness.*—Horses are high in price, but £20 a head for the team all round is fair value, and the 15 per cent. gives only seven years' work. I expect most of mine to work double that, or from four years to eighteen years old at least; but we must allow for risk of death or accident. *Plough.*—I put at £20. Mine cost £18 10s., and I allow 80 days a year in use at least. *Plough Shares.*—My land, Bay of Biscay, is easy on shares. They seldom get bright at fallowing, and I have ploughed 5½ in. to 6 in. deep over 45 acres with one new set of three shares. My estimate was raised to about one share a day to meet the ideas of our Bureau members; this includes grease.

FARM LABOUR.—I pay 20s. and board a week during seed and fallowing time. I know of nothing higher locally.

CULTIVATION.—*Ploughing.*—My teams averaged over four acres a day, ploughing a 94-acre paddock. This, at 12s. for the team, is 3s. per acre. *Scarifying.*—Perhaps eight acres a day is low, and the Hartley Branch seems to think so. Wear and tear is a trifle more than with the plough; allowing only twice the acreage the plough turned over, the cost per acre is half, or 1s. 6d. *Harrowing.*—Seven horses with eight leaves do 50 acres a day without being pushed on this farm. Six horses will easily harrow 36 acres a day; that, at 12s. per day, is 4d. per acre. Cultivation seems high at Hartley. *Seed.*—This includes cost of pickle. The work is done at night. *Drilling.*—My drill teams cart out seed and manure (1 cwt. per acre) to the paddock, are then harnessed to the drills, and averaged over 12 acres each a day, drilling seed and manure on the first 200 acres sown this season, under 1s. per acre. I cannot understand its costing 2s. 6d. at Hartley. *Rolling.*—This I did not allow for, because I did not roll my wheat paddocks last year. It is good farm practice to roll, but I find it very difficult, partly on account of the land being sticky, and partly to find time to roll even the land under crop for hay, or that which is to be cut with the binder, so that the crop for wheat is often not rolled. The cost would be about 10d. per acre.

CARTING TO MARKET.—I purposely left this out, because this can never be a constant factor. Wheat was carted from my neighbour's

farm past me to Saddleworth by a contractor, at 3d. a bag, equal to about 17s. a day. At Mannum it is very high, 6d. a bushel!

CORNSACKS cost me 5s. 9d. per dozen, or 1s. 11d. an acre, leaving 1d. for twine and 6½d. per acre for labour, 1½d. per bag.

REAPING.—I can strip an acre of wheat a great deal quicker than I can plough it with the same strength, yet at Mannum it appears to take as long for the team to strip an acre as it did to fallow it. I should have thought the cost high at 2s. 6d.

With regard to *Sundays and wet days*: These, together with other matters, enter into the broader aspect of the question. Mr. Robert Townsend and others have discussed wheatgrowing from the standpoint of the farm rather than the acre, giving the cost of live and dead stock as well as expenses in working such a farm for the production of wheat. As a guide to prospective wheatgrowers such figures are most interesting. Mr. Townsend makes the cost 2s. 5½d. per bushel. On a mixed farm such as mine, where dairying and sheep each return about as much as does the wheat crop, it is not easy to say what expense in cultivation or crop is fairly chargeable to the wheat crop alone or to allot the time when teams are idle and the farm hands engaged at odd jobs or at unproductive work. Such considerations make the estimate more complicated, and I wanted to keep it simple. Allowing for one wet day a week, the cost of feed for Sunday and such wet day, divided over the other five days, would be 1s. 10d. more a day, and raise the total cost per acre from £1 9s. 7d. to £1 11s. 4d. The cost per bushel would be raised from 2s. to 2s. 1½d. on fallow land. Many Bureaus consider my estimate too low. Koolunga Branch doubts if wheatgrowing itself actually pays, and Millicent, Calca, Colton, Mount Remarkable, Mannum, Morphett Vale, and Arthurlton Branches seem to be of the same mind.

I regret that so many consider our great national product, of whose quality we are justly proud, is grown in this State at a loss—a poor lookout, and by no means likely to induce an increased rural population to settle on the land. I am very glad to join with Mr. Townsend, of this district, and say with him, "*Wheatgrowing pays here.*" I am satisfied wheat can be grown profitably at 2s. 6d. per bushel, after allowing for all reasonable expenses. It would appear that wheat can be grown at small cost at Morgan. They need no manure, probably because, unfortunately, they get no crop five years out of six. Their estimate of 11s. 7d. is not really low.

If this discussion leads farmers to look into the cost of wheatgrowing, comparing the cost of cropping fallow and stubble, the consideration of this question will not have been in vain, even though no definite estimate of the cost of our wheatgrowing results.

THE DUCK.

By D. F. LAURIE.

Duck-breeding is a branch of the poultry industry which to a great extent is neglected in this State, and yet, if properly managed, can be made to yield a handsome profit. One great advantage of the duck over other kinds of poultry is its rapid growth and early maturing. Ducklings in prime condition can be raised fit for market or export in from eight to nine weeks, a period at which chickens, turkey poults, or goslings would find no sale here as articles for immediate consumption. Recently a well-known poultry enthusiast, who is keenly alive to the value of duck-breeding, told me that were he out of harness he could make an excellent living by breeding ducklings for the Adelaide market alone. Except at certain seasons it is a difficult matter to procure ducklings, and really prime specimens are scarce even during the season of plenty.

Some people have an aversion to ducks because, if not carefully attended to, they make their yards very sloppy and dirty. On some soils this difficulty is somewhat great, but on porous, well drained, or sandy soils the conditions are more favourable. With proper attention, a smaller area of land is required for duck farming than for chicken rearing. It may here be pointed out that, although experienced breeders in specially favoured parts of the country could doubtless make a living by duck-breeding alone, this article is not to be taken as meaning that any inexperienced person can do so.

Those readers who keep ducks at present may or may not know the points and commercial value of the different breeds, the best methods of feeding, housing, rearing, etc. Those who do not keep ducks, and who may wish to do so, may learn that it is more profitable to keep the best sorts for a given purpose. If every duck-breeder will discard the worthless, under-sized mongrels so commonly seen, and procure such modern specimens as can be kept at a profit, the main object of this article will be attained. Poultry breeding is gaining in popularity, and soon there should be a far better supply for market: inferior quality realises low prices, while for superior birds there is always a good demand. Then, as the supply of birds of good quality increases, we can cater for the export trade, which offers a huge market for all poultry of high quality. I should not, however, advise any one to launch out on too extensive a scale. Experienced breeders know as well as I do what they can undertake. In urging the possibilities of duck-breeding, I wish to avoid the danger of unduly influencing the novice; at the same time, there are others who are prejudiced against poultry breeding simply because they are not acquainted with the facts of the case. Of two persons one will rear and market his ducklings at a good profit, while his neighbour can show only half-starved runts at the same age. Unfortunately, it is the unsuccessful, shiftless person whose opinions of the industry are expressed in the loudest tones.

Ducks can be kept at a good profit when every item of food has to be purchased, even at prices somewhat above the normal; the profit is proportionately greater when food is cheap, or has not to be purchased. A common mistake is in keeping large numbers of inferior ducks as stock birds; the adult duck is a great eater, and costs a lot to keep. If, however, a less number of birds of good strains are kept, there will be a longer breeding season, and at other times of the year there will be a good return for eggs. Many, in fact, the majority of common ducks lay from 50 to 70 eggs a year, some flocks many less; from such the only profit is their increase; the eggs barely pay cost of feeding. There are strains of ducks of different breeds which lay up to and over 200 eggs a year, and which yield a profit for eggs alone. This is more the class of duck to be recommended, and they are as hardy and more pleasing in appearance than the mongrels.

It is very gratifying to note that throughout Australia the duck is attracting attention. For some years breeding for market has been advocated by many writers in the poultry press, and within the last ten years the high laying powers of certain strains of several breeds have been pointed out as profitable for egg production.

DUCK LAYING COMPETITIONS.

The champions of various breeds of ducks have long pointed out the profits to be derived from ducks as egg-layers. Some months ago the proprietors of *The Australian Hen* started a duck laying competition in New South Wales. At the end of March, nine months from the start, the leading pen (Buff Orpington ducks) had laid 888 eggs (an average of 148 each for the six ducks), valued at £3 7s. 8d. The worst performers of the 19 pens were Muscovys, which laid 319 eggs (an average of 53.1 per bird), total value, £1 4s. 3d. Twelve pens averaged 100 eggs per bird and upwards. A number of prominent South Australian breeders have arranged a similar competition to be held at Mr. L. C. Dobbie's poultry farm, Lyndoch.

Although certain breeds have recently come before the public as great layers, there are strains of the older breeds which have excellent records, and this is an important point to consider when selecting stock. In giving details of the various breeds no undue stress will be laid upon any beyond its deserts. All have their good points; some are to be recommended before others for certain purposes, as will be seen later on.

BREEDS OF DUCKS.

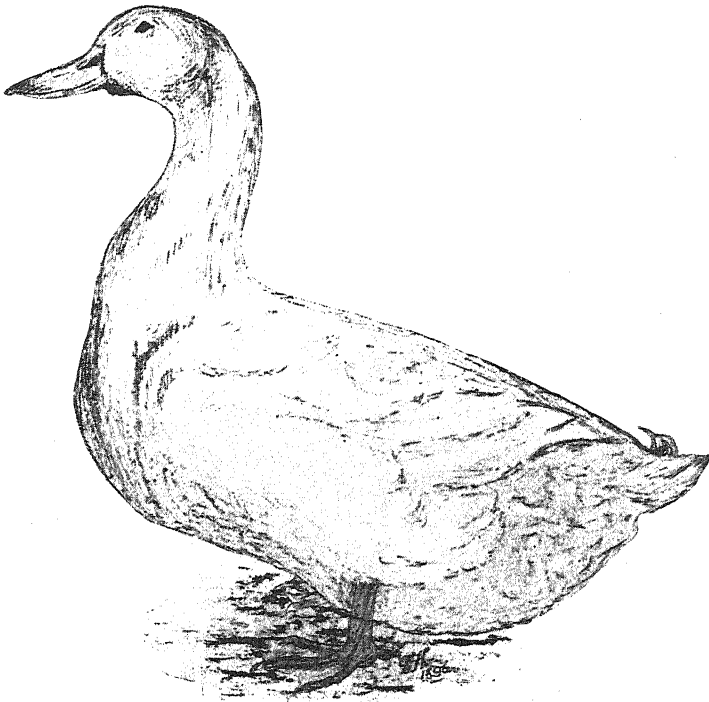
The principal breeds of domestic duck, with the exception of the Muscovy or Musk (as it has sometimes been called) are descended from the wild duck or mallard. This duck, which somewhat resembles the Rouen in colour, is common in Europe and the greater part of North America. The Muscovy duck is a native of South America, and Darwin, in his "Travels on the Amazon," mentions the bird, and remarks on

its noisy flight, owing to the rapid motion of the wings necessary to support so large a bird. This was in the early thirties. The Indian Runner, structurally somewhat different to other breeds, is claimed to have originated in India. The Pekin, a Chinese breed, is also noticeable for its upright gait, which in both breeds may be due either to common origin or to environment. Several modern varieties are of very recent origin, the result of various crosses: definite types are being fixed, and in some cases are permanent. Although the pride of place has hitherto been awarded to the celebrated English breed of ducks, the Aylesbury, the more recently introduced Pekin is finding great favour in England. As to the origin of the white-plumaged breeds it is interesting to note that Mr. Ambrose, of Ely, England, has some hundreds of white-plumaged wild ducks in his decoys that were bred from some sports captured some years since: they are not albinos. As will be pointed out later on, a great disadvantage which the dark-plumaged duckling suffers is due to the fact that the pin, or immature, feathers are black, and detract considerably from the appearance of the bird when plucked and dressed. For this reason the Aylesbury and Pekin ducks, or crossbreds therefrom, are recommended for market and export.

THE AYLESBURY.

This breed has long been known in this State, and at times some very excellent specimens have been exhibited. Whether through lack of skill in breeding or on account of our climate, the breed soon deteriorates, and fresh blood must be introduced, thus preventing the formation of definite local strains. To overcome this difficulty Pekin blood has been introduced by some breeders, and although to an inexperienced observer the carriage, bill, etc., may appear in accordance with the Aylesbury standard, there are generally a shortening of bill and a thickening of head (too much cheek), which tell the tale. Show birds have also been bred especially to accentuate the massive look, combined with excessive *keel*, as demanded by judges. These points have not increased the market value by any means, the poulterers objecting strongly. In consequence, more favour has of late been bestowed upon the Pekin. Still, there is the fact that the Aylesbury ducklings command the best prices in London, and wherever used as a cross with Pekins add quality such as is approved in England. In view of the fact that crosses with the Pekin are common in England, it is not to be wondered at that Mr. Harrison Weir, a breeder and fancier of sixty years' standing, should bewail the fact that Aylesbury ducks of undoubted purity are becoming scarce. He claims that this breed was the earliest and most prolific, a good layer, broad in build, not too long, with fleshy breasts of the most delicate flavour, and of the finest quality. The original pure Aylesbury ducks had light, rose-tinted shanks and feet, while on the modern show bird they are bright orange in colour. The following appeared in *The Poultry Chronicle* in 1855, the result of enquiry among large and ex-

perienced breeders:—"The reply from one and all is that the pure duck should be long and broad in body, the breast full, the legs strong and of a pink colour, the head large and bill long, broad and flat as possible, free from spots, nearly flesh-coloured in the young birds, and more of a white in the adult, feathers close and white as snow all over." Notwithstanding the fears expressed that this grand breed is in danger, the fact remains that during thirty or forty years the size and weight have been almost doubled. The old idea that perfect specimens could be bred in the Aylesbury district only is exploded. Many of the finest specimens



Typical Aylesbury Drake.

ever seen in the show pen in recent years have been bred in Scotland. Mr. John Gillies, a noted breeder, has frequently had drakes weighing 12 lb. at six months old, and in 1897 one was reported as weighing 13½ lb. at this age.

Taking the modern Aylesbury duck, with all the faults alleged by old-time fanciers, we have, perhaps, the largest (except Muscovy) duck, giving us a beautiful white skin, and flesh of the highest quality. The cross with the Pekin is highly recommended for Australia, and numbers of these crossbreds when shipped to England have realised satisfactory prices. In Victoria I have at times inspected large numbers of very fine specimens in the show pens and in breeders' yards, and cannot help re-

gretting that the breed is so neglected here. We sadly need a Waterfowl Club here to infuse more enthusiasm into our breeders and fanciers.

The standard of perfection of the modern Aylesbury is as follows:—

GENERAL CHARACTERISTICS (EITHER SEX).—*Head and Neck*.—Head, long and straight. Bill, long, broad, and strong. The head and bill measure from 6 to 8 in. Eye, dark and full. Neck, long, medium thickness, slightly curved. *Body*.—Breast, full and deep. Keel, very deep, quite straight, and extending from just behind the legs to breast. *Back*.—Long and broad. *Wings*.—Strong, and curved close to the side. *Tail*.—Short, slightly elevated, with two or three curled feathers on the centre of the drake's. *Legs and Feet*.—Very strong and thick in bone, well set so as to evenly balance body. *Toes*.—Straight, connected by the web.

GENERAL SHAPE AND CARRIAGE.—Large, straight head and bill, well carried on fairly long neck. Body very massive, with good girth, deep and straight keel, and a full breast, carried low.

SIZE AND WEIGHT.—The larger the better. Drake at six months old should weigh not less than 10 lb., a duckling not less than 9 lb. The second year and afterwards the duck should equal the drake in weight, and neither should be under 11 lb. Anything over these weights to count extra merit.

PLUMAGE.—Bright, smooth, glossy. *Colour in Drake or Duck*.—Bill, pinky white. Plumage, pure white throughout. Shanks and feet, bright orange.

VALUE OF POINTS IN AYLESBURYS.

Defects.						Deduct up to
Defects in head and bill	...	...	...	...	...	15
Defects in neck	...	...	...	...	...	5
Defects in breast and keel	...	...	...	...	...	20
Defects in legs and feet	...	...	...	...	...	5
Defects in plumage and colour	...	...	...	...	...	10
Want of symmetry	...	...	...	...	...	10
Want of size	...	...	...	...	...	20
Want of condition	...	...	...	...	...	15
						<hr/>
A perfect bird to count	...	...	...	...	...	100

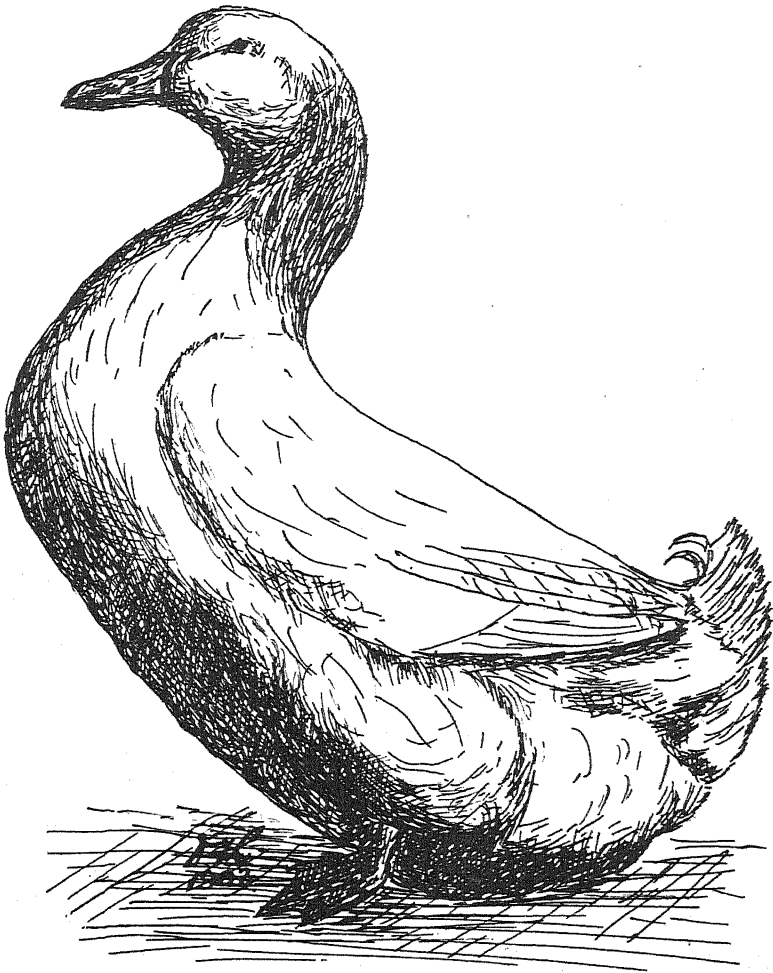
Serious defects, for which a bird should be passed:—Crooked back, wry tail, or any other deformity. Any coloured feathers.

An accurate knowledge of the standard points of any breed is quite as necessary for utility purposes as if for show. To use a mongrel when a purebred is required will result in disappointment. Such knowledge also cultivates the powers of observation.

THE PEKIN DUCK.

This is a breed which has of late years been vastly improved as regards size and colour; for, although generally spoken of as a white duck, a prominent characteristic is the canary under-colour which is

universally admired. The Pekin is the favourite duck in America and Australia, while in England, apart from its favour as a show breed, even conservative poulterers and others are giving it a cordial welcome as a table bird. The introduction of the Pekin duck dates back some thirty years as regards England, and about twenty years as regards this State. At our shows the Pekins on certain occasions made quite a sensation, and



Typical Pekin Drake.

many will remember some fine specimens purchased from Victorian breeders, and which proved quite a revelation here. The early specimens included some remarkable layers, and it is pleasing to record that there are many strains, including some here, that have a remarkable egg record. The upright carriage and peculiar growth of the feathers under

the rump give a distinct appearance to the breed. The upright carriage is due to the legs being placed far back, and not in the middle of the body, as with Aylesburys and Rouens. The head is large, and shows a strongly marked cheek, which, with the short bill, constitute other important distinguishing points. The Pekin is somewhat timid, and much damage may result if a flock be disturbed at night and rush about. The voice is loud and deep, a point not liked by those living close to a Pekin duckery.

For the export trade, the Pekin pure, or crossed with the Aylesbury, is excellent. The rapid growth and splendid weight, as well as the fattening qualities, all make in the right direction. Given sound stock birds and proper feeding, the birds are fit for any market at from seven to nine weeks, and at eight are well suited for export. It is stated that a great point in favour of the Pekin is the absence of the keel, which is held to detract from the Aylesbury. Of course, there are plenty of birds exhibited as Pekins which have a keel, but they should never win prizes. There was quite a storm at the last Melbourne Show because the judge "passed" a number of "keeled" birds. Our breeders should note that the absence of keel is one point which the London poulterers view with favour. There have been disputes as to the merits of the Pekin duck as a table bird, and it has been asserted that it is unsuited for the English markets. There was a certain amount of prejudice at one time, but this is disappearing. The fact that so conservative an authority as Mr. Harrison Weir views this breed with favour is worthy of note. The greater part of the Canadian frozen ducklings are Pekins, and these bring excellent prices in England.

The standard for judging Pekin ducks is as under:—

GENERAL CHARACTERISTICS (EITHER SEX.)—*Head*.—Large, with broad and prominent skull, rising rather abruptly from base of bill. *Bill*.—Short, broad, and thick, slightly convex between the junction with head and the tip. *Eye*.—Dark and partially shaded by heavy eyebrows. *Neck*.—Long and thick, carried well forward, and well arched. *Body*.—Medium length, and as broad as possible. *Breast*.—Wide and prominent, and descending even, solid, and uniform with girth to paunch. No indication of keel. *Paunch*.—Broad, and to end of tail forming a perfect half-circle when standing erect. *Back*.—Broad. *Wings*.—Short, and carried close to the side. *Tail*.—Well spread, and carried high. The drake should have two or three curled feathers on top. *Legs and Feet*.—Strong and stout, set far back, causing erect carriage. *Toes*.—Straight, connected by the web.

GENERAL SHAPE AND CARRIAGE.—Almost upright in appearance, elevated in front, sloping downward toward the rear.

SIZE AND WEIGHT.—As large as possible. Drakes from 8 lb. to 9 lb. Ducks, from 7 lb. to 8 lb. Any excess over these weights to count as extra merit.

PLUMAGE.—Very abundant, with plenty of long, soft, downy feathers on the thighs.

COLOUR.—*In Both Sexes.*—Bill, bright orange, free from black marks. Eye, dark leaden blue. Plumage, deep creamy white colour throughout. Shanks and toes, bright orange colour.

VALUE OF POINTS IN PEKIN DUCKS.

Defects.	Deduct up to Points.
Defects in head and bill	15
Defects in neck	5
Defects in body	10
Defects in tail	5
Defects in legs and feet	5
Defects in plumage	15
Want of style and symmetry	15
Want of size	20
Want of condition	10
<hr/>	
A perfect bird to count	100

Serious defects, for which a bird should be passed:—Crooked back, wry tail, or other deformity, white plumage, black marks or spots on bill.

It is maintained by some writers that while there is an increase in size in Pekins, some original characteristics have been lost. Mr. Harrison Weir speaks of a magnificent crested Pekin drake, the property of Miss Croad. This drake came from Lanshan, a district famous as the home of the Langshan fowl. Other birds had manes and crests, and the former were likened to the crest of the old-time Turbit pigeon. In many Pekins there is evidence of remains of the mane. Of course, the fancier, judge, and faddist is blamed for the loss of these points, but I think most people, on reflection, will agree that we might have witnessed such a craze for mane and crest that all utility points would have been neglected. Although the standard for judging offers a premium for size and weight, it is well known that large, heavy specimens are not the best for stock purposes. When we see more classes at our shows for young birds, especially ducklings for table purposes, the large, heavy ducklings will be the more welcome. The proper course is not to breed from the mammoth birds, but to retain for stud purposes such birds as can give the necessary stamina to enable well-fed ducklings to reach these large proportions. The medium weights are those to be recommended as stud birds; but under-sized birds should be avoided, as these show signs either of deterioration or of starvation during a critical period. The excellent laying powers of the ducks and the hardiness of the ducklings enable one to breed during a long period. At time of writing, one breeder has quite a number of recently hatched ducklings, and I notice advertisements of stock which must have been bred late in the summer. I have seen Pekins

thriving on various soils, from the sand at Glenelg to clay in small back yards. I have not sufficient evidence at hand to decide as to which duck stands our summer best. The fact that the Pekin improves in Australia seems to point to a suitable climate. This, however, depends on the treatment accorded, and as duck-breeding is better understood we shall find less losses due to hot sun, etc. Shade and shelter are highly necessary for ducks, old and young, and where such matters were attended to during the great heat wave last summer few deaths occurred.

The two breeds already described stand easily first for size, quality, and suitability for the export trade. Later on I shall deal with other varieties and breeds, some of which are noted for egg production, while others are of too recent origin to enable one to gather much evidence in their favour or otherwise. Old and tried breeds deserve first place, because new ones, while pleasing to the few, may not be appreciated by the many we have to cater for.

(To be continued.)

DOOKIE EGG-LAYING COMPETITION.

The first Victorian egg-laying competition conducted at the Dookie Agricultural College concluded on April 30, 1905. The following table gives the results each quarter from the fifteen leading pens, and makes interesting reading when compared with the results from the Hawkesbury competition, which were published last month, and those from Roseworthy competition:—

Breed.	Owner.	Eggs Laid During					Money Value of Eggs for 12 Months.
		May June July	Aug. Sept. Oct.	Nov. Dec. Jan.	Feb. Mar. April	Total for 12 Mons.	
White Leghorn ...	G. Leven ...	496	359	315	233	1,313	£ s. d. 4 19 11½
Minorca ...	G. E. Gates ...	204	447	391	212	1,254	4 5 8½
Black Orpington ...	G. N. Commins ...	287	414	271	256	1,228	4 10 10½
Minorca ...	Miss Knox ...	198	388	417	215	1,218	4 3 4
Pile Leghorn ...	W. J. Hudson ...	330	388	304	190	1,212	4 10 0
White Leghorn ...	R. Kerr ...	217	429	372	192	1,210	4 4 2½
Langshan ...	Ponton & Son ...	241	491	327	144	1,203	4 0 11½
Golden Wyandotte...	A. Fahey ...	347	356	275	220	1,198	4 11 5½
Andalusian ...	W. Evenden ...	214	432	303	210	1,159	4 1 2½
Brown Leghorn ...	D. T. Lawrance ...	260	414	304	171	1,149	4 0 10½
Silver Wyandotte ...	T. A. Hooper ...	294	387	289	172	1,142	4 2 2
Black Orpington ...	A. Wedlich ...	248	415	314	148	1,125	3 17 5½
Black Orpington ...	T. Lee ...	192	411	347	157	1,107	3 13 11
Black Hamburg ...	Ballarat Poultry Farm	146	379	362	215	1,102	3 14 6½
Black Orpington ...	Mrs. A. Wedlich ...	281	406	246	152	1,085	3 17 2
Golden Wyandottes	J. Boyle ...	252	356	285	160	1,053	3 15 2½

Compared with Hawkesbury results, the Dookie figures show considerable improvement. In the former, the best pen averaged 204 eggs per annum, and in the latter 218 5-6 eggs, while at Roseworthy the best figure was 208½ eggs per hen. At Dookie seven pens averaged over 200 eggs per head, while at both Hawkesbury and Roseworthy only one pen reached that average. The egg values at Hawkesbury are considerably better, but this is due entirely to the higher prices realised for the eggs. At Dookie the price varied from 7d. to 1s. 5d. per dozen, as against 7d. to 2s. 1d. per dozen at Hawkesbury. The annual cost of food per hen averaged 4s. 8d. and 4s. 5d. respectively.

In the Dookie competition the Minorcas and Black Orpingtons have done remarkably well. The latter averaged 175 eggs per annum from nine pens, while the Minorcas, with fewer pens, reached the average of 180·8. They took second and fourth places in the egg record, and have created a genuine surprise, as this one time popular breed has of late years been in the background. Only two pens of White Leghorns took part in the competition, and these occupied first and sixth positions.

Mr. G. Leven's White Leghorns, which won first prize, also put up a record yield in these competitions, their total being five more than the previous record, made by Mr. R. E. Warren's Silver Wyandottes, at Hawkesbury, last year. Messrs. Ponton & Son's Langshans have put up a record for the three months of August, September, and October which will prove very difficult to displace. For six hens to average 82 eggs each in 91 days is indeed a remarkable record.

The general feeding of the birds was as follows:—The morning meal consisted of a mash containing 1 part wheaten chaff, 1 part meat scraps, 2 parts bran, 5 parts pollard, and 5 parts water. The chaff was steeped over night to soften it. The evening meal consisted of good second quality wheat. Grit and green feed were provided. The green feed consisted principally of grass, barley, millet, kale, and rape. In the summer the rape and kale proved to be too strongly flavoured.

ROSEWORTHY COLLEGE EGG-LAYING COMPETITION.

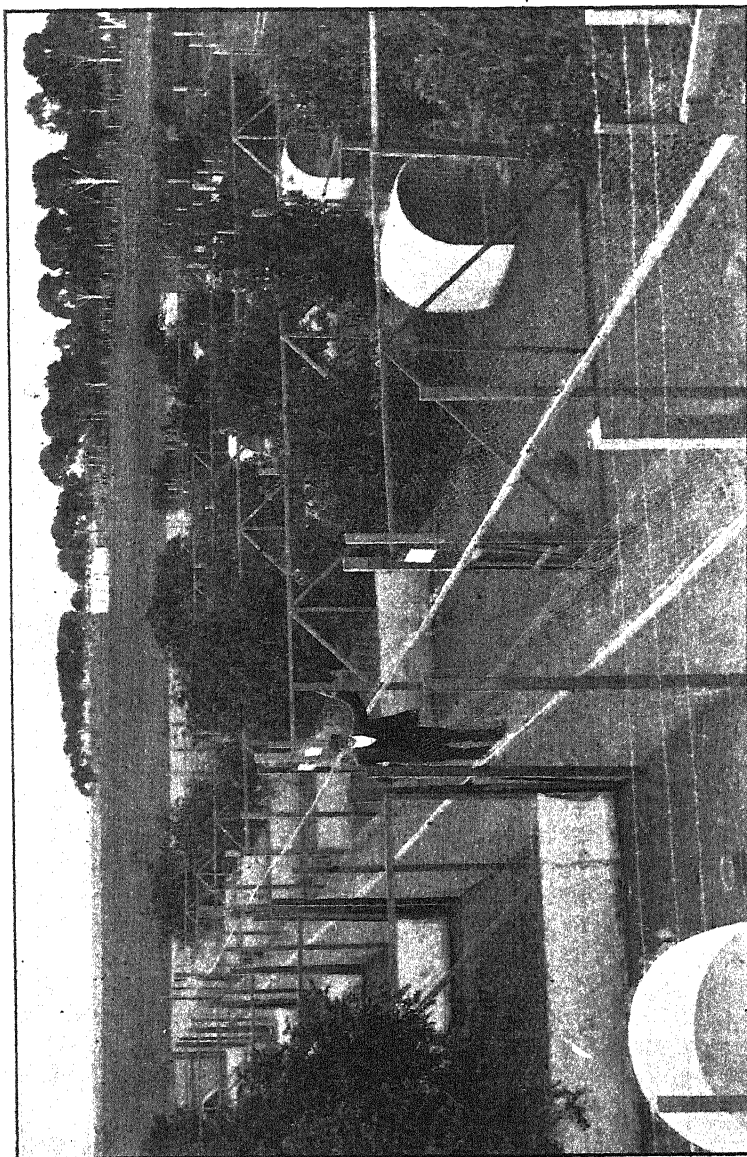
By W. R. DAY.

The third egg-laying competition, under the auspices of the Royal Agricultural and Horticultural Society of South Australia, was started at the Agricultural College, Roseworthy, on Saturday, May 20, 1905, on the same site and under somewhat similar conditions to the second contest, which closed on May 14. The first of the birds arrived on the 16th, and consignments were received at intervals until the evening of the 18th, by which time 30 pens were occupied by six hens or pullets, representing nine different breeds, competing in the interests of the following owners:—

Owners.	Pen.	Address.	Breed.
C. W. L. Muecke ...	1	Burnside ...	White Leghorns
A. H. Padman ...	2	Hyde Park ...	White Leghorns
S. H. Pitman ...	3	East Payneham ...	White Leghorns
H. Longley ...	4	Gawler ...	White Leghorns
T. Parish ...	5	Murray Bridge ...	White Leghorns
T. B. Brooks ...	6	Clarendon ...	White Leghorns
J. Von Bertouch ...	7	Kapunda ...	White Leghorns
L. C. Dobbie ...	8	Lyndoch ...	White Leghorns
T. E. Yelland ...	9	North Unley ...	White Leghorns
C. Foot ...	10	Hectorville ...	White Leghorns
H. C. Dobbie ...	11	College Park ...	White Leghorns
A. E. Kinnear ...	12	Unley ...	White Leghorns
L. C. Dobbie ...	13	Lyndoch ...	Silver Wyandottes
W. A. E. Smith ...	14	Black Forest ...	Silver Wyandottes
N. Brookman ...	15	Glenthorne ...	Silver Wyandottes
J. G. Balfour ...	16	Rundle St., Adelaide ...	Silver Wyandottes
D. W. Bartlett ...	17	Goodwood Road ...	Silver Wyandottes
H. J. Dobbie ...	18	College Park ...	Silver Wyandottes
H. C. Bennett ...	19	Gawler ...	Silver Wyandottes
P. W. Mellor ...	20	Fulham ...	Golden Wyandottes
C. Wright ...	21	Alberton ...	White Wyandottes (this pen is unoccupied at present)
J. & A. Gibbons ...	22	Enfield ...	White Wyandottes
J. Hunter, jun. ...	23	Clare ...	Black Orpingtons
F. J. Wimple ...	24	Grenfell St., Adelaide ...	Black Orpingtons
W. F. Krummell ...	25	Eudunda ...	Black Orpingtons
J. Francis ...	26	Fullarton ...	Black Orpingtons
R. Laidlaw ...	27	Mt. Bryan ...	Buff Orpingtons
N. Brookman ...	28	Glenthorne ...	White Orpingtons
Penglase Bros. ...	29	Hallett ...	Minorcas
W. F. Evenden ...	30	Croydon, N.S.W. ...	Black Andalusians
H. Dix ...	31	Clarendon ...	White Leghorns

The birds, taken right through, are a clean and healthy-looking lot, and some have started right away at the business for which they were sent here, viz., egg production. I should say most of the birds are at the right age to start on the year's contest, but some appear to be too young, hardly having got beyond the chicken stage. Old hens are conspicuous by their almost total absence, which is a good thing, as past experience has proved that they do little beyond pulling down the percentage of eggs laid by younger birds. The fowls are rapidly becoming accustomed to their new homes and surroundings. The yards, which measure 24 x 24 feet, with an average of three carob trees of good growth enclosed, have all been well forked over, for two reasons. One, because it is the best way to keep the ground from becoming foul, and the second because it affords the birds every opportunity to clean themselves by fluffing in the dust.

Hay litter has been spread about each pen for foraging purposes, and the fowls appear to appreciate it very much, as they are almost continually scratching and foraging for grain, etc., thereby getting a good deal of exercise. This should help to produce warmth, which goes a long way towards filling the egg basket during the cold weather, as experience has taught us that if we want our fowls to lay during the cold



Roseworthy Egg-laying Competition. General View of the Pens.

and wet weather we must assist them in every possible way to keep up the necessary temperature of the body. This can best be attained by offering them inducements to be active and energetic. They should be continually on the move, if possible, and not allowed to get huddled up in one corner of the yard, just moping from one feed time until the next, which they will do if cold.

The system of feeding the fowls for the remainder of this month will be as follows:—7 a.m.—Bran and pollard mash, mixed with crushed liver and hot liver soup on four mornings and hot water only on the remaining three mornings, and fed to the fowls in a crumbling state, so that it will fall to pieces when dropped from the hand to the ground. If the mash is mixed properly it tends materially to lessen the risk of both diarrhoea and constipation. 12 noon—Crushed bone and green feed, such as milk thistles, of which fowls are very fond, rape, cabbage, silver beet, etc., varied daily. 4.30 p.m.—Grain thrown into litter. The eggs will be gathered at about 4.30 p.m. daily. The quantities and cost of feed per pen will be given in a later issue of *The Journal*. A plentiful supply of shell grit, oyster shell, quartz grit, and charcoal is always within reach of the fowls, and fresh water is supplied daily in clean vessels placed in the shade. Cleanliness and regularity in feeding are strictly adhered to at all times.

FARM ACCOUNTS.

By F. W. RUSSACK.

(Continued.)

Last month I promised to outline a simple method of keeping farm accounts, within the capacity of those who had no knowledge of the technicalities of bookkeeping, but who could write legibly and do a little reckoning. And I wish to repeat here that in this instance I shall make no attempt to exhibit a system of bookkeeping applicable to all cases, or likely to be approved of by all accountants. Those who have to deal with very large properties, and can command the necessary clerical assistance, are in a position to select for themselves, and follow such a method of keeping their books as best suits their particular needs or wishes. At present my object is to help those who have hitherto neglected keeping on the track of their business as average farmers, but who are now anxious to fix their financial position, and not lose sight of it in the future.

The very simplest way of determining gains and losses is to make an inventory every year, at the same time of the year. In this State March 31 is about the best date for this work; for by then the harvest has been gathered in and perhaps disposed of, whilst the operations of the next season are well in view. The inventory is a detailed statement, giving particulars as to the extent and value of—

1. All the personal property used on and belonging exclusively to the farm.
2. All the real estate owned by the farmer and used for farming purposes.

This inventory should be made very carefully, every item having its value attached to it. Careful and systematic stocktaking is just as essential in farming as in any other line of business. The task of writing such an inventory may appear very simple; and, in fact, it is not a difficult one; yet those who have never attempted it and begin now will be surprised to find how much the judgment is called into play. This will become all the more evident when, after the lapse of a year, a second inventory is taken, and allowances have to be made for improvements and depreciations, losses and breakages in this or that direction. The results of carelessness will stand out in bold relief when the implement valued at £40 in the first inventory has to be entered in the second as worth only £20, the effect of many months' exposure to all sorts of weather.

The following inventory will serve to illustrate the simplest way of determining whether there has been a gain or loss on the year's operations:—

Inventory of the Property of John Prosper, taken March 31, 1904:—

PERSONAL PROPERTY.

TEAMS.

	£	s.	d.
1 bay mare, Topsy, 10 years	18	0	0
1 bay horse, Tom, 12 years	16	0	0
1 bay mare, Norah, 7 years	30	0	0
1 bay mare, Dinah, 5 years	35	0	0
1 grey horse, Dick, 5 years	27	0	0
1 grey horse, Harry, 4 years	30	0	0
2 sets double harness, £7 10s. and £5	12	10	0
4 buckets	1	0	0
6 horse covers	1	8	0
2 whips	0	8	0
2 currycombs and brushes	0	4	6
1 set single harness	5	0	0
15 tons horse hay	30	0	0
Total	£206	10	6

LIVE STOCK.

100 ewes, at 17s. 6d.	87	10	0
1 milch cow, Daisy	8	0	0
1 milch cow, Trilby	7	10	0
1 milch cow, Till	7	0	0
1 milch cow, Lucy	7	0	0

1 milch cow, Fidget	...	...	...	...	...	7	0	0
3 yearling heifers, at £5	...	...	...	...	...	15	0	0
1 steer, two years old	...	...	...	...	...	7	0	0
1 two-year-old bull, Billy	...	...	...	...	...	20	0	0
30 pigs, at £1 5s.	...	...	...	...	...	37	10	0
100 poultry	...	...	...	...	...	10	0	0
Total	...	...	...	...	...	£213	10	0

PLANT.

1 binder	...	...	...	...	...	29	0	0
1 mower	...	...	...	...	...	7	10	0
2 ploughs	...	...	...	...	...	12	0	0
1 set harrows	...	...	...	...	...	3	5	0
1 seeddrill	...	...	...	...	...	31	0	0
1 German wagon	...	...	...	...	...	35	0	0
1 tip-dray	...	...	...	...	...	17	0	0
3 saws	...	...	...	...	...	0	10	0
2 spades	...	...	...	...	...	0	7	6
2 picks	...	...	...	...	...	0	5	0
1 shovel	...	...	...	...	...	0	2	9
4 hay forks	...	...	...	...	...	0	10	0
1 cultivator	...	...	...	...	...	8	10	0
1 lot carpenter's tools	...	...	...	...	...	2	5	0
20 cornsacks	...	...	...	...	...	0	8	4
1 churn	...	...	...	...	...	3	0	0
1 separator	...	...	...	...	...	12	0	0
Dairy utensils	...	...	...	...	...	2	10	0
Total	...	...	...	...	...	£165	3	7

FARM PRODUCE.

40 tons hay, at £2	...	...	...	...	...	80	0	0
200 bushels wheat, at 3s.	...	...	...	...	...	30	0	0
100 bushels oats, at 1s. 6d.	...	...	...	...	...	7	10	0
Total	...	...	...	...	...	£117	10	0

DEBTS RECEIVABLE.

James Andrew	...	...	...	...	...	15	0	0
Peter Jones	...	...	...	...	...	21	0	0
Total	...	...	...	...	...	£36	0	0

CASH.

In bank	...	...	...	...	...	183	11	6
In hand	...	...	...	...	...	6	8	6
Total	...	...	...	...	...	£190	0	0

DEBTS PAYABLE.

Blacksmith	...	...	...	...	...	3	11	5
Saddler	...	...	...	...	...	2	6	8
<hr/>								
Total	...	...	...	...	...	£5	18	1

SUMMARY (March 31, 1904).

PERSONAL PROPERTY.

Teams	...	...	...	...	...	206	10	6
Live stock	...	...	...	...	...	213	10	0
Plant	...	...	...	...	...	165	3	7
Farm produce	...	...	...	...	...	117	10	0
Debts receivable	...	...	...	...	...	36	0	0
Cash	...	...	...	...	...	190	0	0
<hr/>								
						£928	14	1
Less debts payable	...	...	...	...	...	5	18	1
<hr/>								
Net assets	...	...	...	...	...	£922	16	0

REAL ESTATE.

Farm, including buildings and other
improvements, 610 acres at £5 £3,050 0 0

Less—

Mortgage, £1,100 and six months accrued interest, at 5 per cent.	1,127	10	0
Net value	...	...	1,922 10 0
Net personal property	...	...	922 16 0

Total net assets April 1, 1904 ... £2,845 6 0

The above shows John Prosper's financial standing on April 1, 1904, On March 31, 1905, another inventory should have been made, on the same lines as the one shown above. To save space, I shall here merely give what might have been the summary of such an inventory:—

SUMMARY (March 31, 1905).

Teams	...	...	...	...	£200	10	0
Live stock	...	...	...	...	258	10	0
Plant	...	...	...	...	155	6	9
Farm produce	...	...	...	...	89	10	0
Debts receivable	...	...	...	...	28	7	6
Cash	...	...	...	...	306	18	4
<hr/>							
					1,039	2	7
Less debts payable	...	...	...	...	38	7	3
<hr/>							
Net personal assets	...	...	...	...	£1,000	15	4

Value of farm and improvements	£3,050	0	0
Less balance of mortgage unpaid	... 850	0	0
Net real estate	... ..	2,200	0 0
<hr/>			
Net value of all property, April 1, 1905	...£3,200	15	4
Net value of all property, April 1, 1904	... 2,845	6	0
<hr/>			
Gain for the year	... ..	£355	9 4

It will be seen that there are differences in the values, as shown in the first and the second summary; some lines are smaller and some lines bigger in the later than in the former. The total net assets, however, at the end of the year exceed those at the beginning by £355 9s. 4d., and that sum represents the profit on the year's operations. It will be noted that household goods have been quite omitted. These are no part of the business of the farm. Further reference will be made later to them and to household expenses.

These inventories and summaries are of great value. They should be entered yearly in a book bought for the purpose. In this the farmer will have a permanent record of his net assets at the end of each successive year, and of his net gain or loss during that year.

Inventories, however, give the farmer no information as to the exact sources of his gains and losses. In order to determine these he must keep more detailed accounts, and with such I hope to deal in the next article.

(To be continued.)

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, May 10, there being present—Colonel Rowell, C.B. (Chairman), Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, J. Miller, R. Caldwell, and R. Marshall.

The Secretary for Agriculture forwarded report on Mylor Typical Orchard, and on the experimental work being carried out by the Department. Several members expressed their appreciation of the action of the Government in setting apart a portion of the Kybybolite Estate as an experimental station for the South-East, and believed much good would result therefrom.

It was decided to grant the request of residents in the Hundreds of Stokes and Koppio for the formation of a Branch at Yallunda, provided no other Branch exists within a distance of ten miles.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. J. Kluge, W. Wolf, A. Moore, P. Burger, and W. Hammatt, Lyndoch; Mr. C. W. Martin, Denial Bay; Messrs. O. H. Cowled, R. R. Shaw, and T. Kelly, Crystal Brook; Messrs. A. Moore, B. Schroeter, and J. Drummond, Woodside; Messrs. J. G. Fra-

ser, A. E. Abbott, W. R. McSkimming, and Spencer Kelly, Richman's Creek; Messrs. W. Forrest and H. J. Wasleys, Reeves Plains; Mr. Paul Roediger, Gawler River; Mr. G. E. Wood, Dowlingville; Messrs. G. F. Heinrich and A. Schiller, Eudunda; Mr. McCourt, Kingscote; Messrs. F. Wilson, J. C. A. Hartwig, J. Snodgrass, W. Morgan, A. E. Ross, and E. Promnitz, Waikerie; Messrs. D. McNair, S. Wilkin, W. Wilkin, W. B. Richardson, W. Meadows, H. Thompson, and F. Richardson, Koppio.

Mr. A. Molineux said that *Le Petit Marseillais*, on January 1, 1905, published an article describing varieties of a new species of potato introduced originally from the marshy districts of Uruguay by Professor Heckel. The new varieties had been developed by M. Labergerie, of Verrieres, in La Vienne. The original tubers produced by this plant were bitter and small, but, together with the abundant foliage, were liked by stock. The new varieties produced sweet tubers, of excellent flavour, weighing as much as $3\frac{1}{2}$ lb. in some cases, and up to 39·67 tons per acre. The plant, or tops, reached 14·76 ft. in length. The flowers yielded an intense perfume, similar to that of jasmine, and it was very much stronger in the fruits. *Solanum Commersoni* grew in cold, swampy soils, and Mr. Molineux thought it might possibly thrive in similar localities in our South-East country. It was quite possible that the claims set up for it were exaggerated, but the Agent-General might be requested to secure a few tubers of the best-approved varieties, if the cost was not too great, for trial by selected members of the Agricultural Bureau resident in the swampy districts. *Solanum Commersoni* possessed one commendable characteristic in the fact that it required only one planting to establish it permanently in the soil. It reproduced itself from pieces of roots and from small tubers left after harvesting. The new varieties were said to be disease proof, and it was probable that valuable results would follow cross-fertilisation between *Solanum Commersoni* and *Solanum tuberosum*, or common potato. On the motion of Mr. Molineux, it was decided to request the Government to endeavour to obtain tubers of the best varieties of *Solanum Commersoni* for experimental purposes.

Some discussion took place on the prospects of developing an export trade in honey. Mr. Sandford said he had sent a considerable quantity of honey to his brother to be submitted to leading dealers in London and other large towns in England. He was also trying to secure from England samples of the best European and American honey for comparison with local honey. Mr. Caldwell said he had been talking with a large beekeeper, and was satisfied that if they could develop an export trade in honey the beekeeping industry could be largely extended. The gentleman referred to assured him that so far as the strong flavour in stringybark honey was concerned there would be no difficulty in getting rid of it by a process he had discovered. Mr. Molineux said he purchased some honey recently in a leading Adelaide establishment, and he could easily understand that the export of such inferior stuff would ruin

any export trade. There was plenty of first-class honey, and before they could firmly establish an export trade some action to prevent inferior samples being sent away would be necessary.

Mr Laffer called attention to the manner in which the Western Australian Government was carrying out the regulations regarding the importation of fruit. Speaking from personal experience, he could say that while the inspection was very strict no exception could be taken to it, but the decision of the Government to condemn the whole of any consignment if infested fruit was found in 10 per cent. of the cases was another matter. It meant that one or two codlin fruits in a consignment of ten cases would condemn the whole lot. It simply meant that the risk was so great that they would be unable to ship apples or pears to the west, and he could not help feeling that the regulation was intended to keep out fruit from the eastern States. He thought the Government should make a strong protest to the Commonwealth Government. The charges imposed by the Western Australian Government for inspection were needlessly high, and he believed that the Department of Agriculture made a large profit out of these charges. This was a form of protection they could not very well prevent, but the prohibition of the importation of clean fruit was, in his opinion, totally opposed to the Commonwealth constitution. He moved that the attention of the Hon. Minister of Agriculture be drawn to the matter, and that the Government be asked to enter a strong protest against the carrying out of the regulation. It was also decided to ask that steps be taken to ascertain whether the destruction of clean fruit under such a regulation was not a breach of the Commonwealth constitution. All the members supported Mr. Laffer's remarks, and the resolution was carried unanimously.

Considerable discussion on "dry bible" in cattle took place, members urging the necessity for immediately deputing a veterinary to enquire into the cause of the disease.

"JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,
Adelaide.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on June 1, 1905:—

Seldom do our agriculturists face the winter under more assuring prospects than at present exist, for the past month's rainfall can be best characterised as a splendid one, the downpour being well over the average in most of the farming districts, and, as growing feed has come along excellently, dairy folk have little to fear of a shortage in this direction during the winter. Pastoralists, however, have not been so well favoured, the moist conditions confining themselves only to the fringe of the grazing country.

COMMERCE.—It being between seasons, the mercantile community did not expect the volume of business to be at all heavy, and whilst there was an absence of anything approaching speculative operations, things generally were very sound, the turnover comparing well with corresponding months of previous years. The mines at Broken Hill are making satisfactory progress, shareholders being content not to readily part with their scrip, especially as in metals both Silver and Lead further hardened.

The European markets in Breadstuffs improved during May, and shipments have been sold up to 32/-, both at port of call and for prompt loading. At moment, however, large arrivals have somewhat reduced rates for spot cargoes; but the above quotation can yet be obtained for June shipments. Values in Victoria and New South Wales improved, and higher rates are now asked for Wheat and Flour. In this State the volume of trade was inconsiderable, nearly all transactions being for Wheat already in store. A small business was put through in Flour to local bakers; but to export is unprofitable at present price of Wheat. In Fodder, farmers were disposed to hold on to their Hay; on the other hand, chaffcutters were none too eager. This owing to a very limited shipping enquiry, also the local demand was anything but active. There was fair call for Offal, the supply being much reduced in consequence of a couple of the large mills at Port Adelaide being shut down. In Feeding Grains, sales were dull, and practically no shipping orders came along.

POTATOES.—Although deliveries of "Gambiers" were considerably short of requirements, any rise was precluded owing to the lower quotations from the East and heavy arrivals of Tasmanians; but rather than accept any reduction South-Eastern growers preferred to stack. However, at the close of the month the markets generally were far from active. **ONIONS.**—Very seldom stocks cut off so abruptly as this season, and, although a substantial rise in price was established, dealers were unable to fill anything like their orders.

DAIRY PRODUCE.—It is rare at the beginning of winter that supplies come forward in such increasing quantities as experienced in May, the catalogue at times having more the appearance of the flush of a season. Certainly, in fresh Butters South Australia is yet far short of filling all requirements; but, with each market showing an improvement in the quantities, parcels of bulk Butters from the Eastern States are being gradually pushed aside, grocers operating on these very sparingly, and then only for choice new-made. **Eggs.**—The trend in this line was towards firming; but the presence of heavy parcels of refrigerated and pickled sorts prevented anything like high figures, until the last sale or so, when prices sharply advanced. **Cheese.**—This industry in the past has suffered more or less owing to depression in values; but 1905 has, so far, been much more favourable to makers, quotations gradually hardening, and now approximating the highest for several years. **Bacon.**—It was generally reckoned that the tall rates ruling for beef and mutton would have caused heavier consumption in Bacon; but, so far, curers have found the sales very meagre, and then only for local purposes. **Hams.**—As usual at the time of the year, trade is almost dormant. **Honey.**—The quality of the new take is considered well up to standard; but, until an enquiry outside of South Australia sets in, values are likely to keep low. **Almonds.**—Fair sales have been put through, but no quotable alteration to report.

LIVE POULTRY.—Throughout the month the penning was extensive, and, as there was a decided improvement in the quality of the birds, competition was brisk, resulting in a substantial advance in price being obtained for all prime table sorts.

CARCASE MEAT.—The quantities of porkers submitted in numbers far exceeded the usual experience: but the continued depressed values for the live hog prevented anything like fancy prices ruling. **Veal.**—The dearth in supplies caused keen bidding, and at several markets record rates were secured, especially for prime dairy-fed vealers.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, $3/3\frac{1}{2}$ to $3/4\frac{1}{2}$ per bushel 60 lb.

FLOUR.—City brands, £7/15/-; country, £7/5/-.

BRAN, $1/0\frac{1}{2}$ to $1/1$; **POLLARD,** $1/0\frac{1}{2}$ to $1/1$, per bushel of 20 lb.

OATS.—Local Algerian and Dun, $1/9$ to $1/11$.

BARLEY.—Cape, $2/-$ to $2/3$ per bushel.

CHAFF.—£3/-/- per ton of 2,240 lb., f.o.b. Port Adelaide, for prime.

POTATOES.—Gambiers, £6/5/- to £6/10/- per ton of 2,240 lb.

ONIONS.—£12/-/- to £13/-/- for prime, per ton of 2,240 lb.

BUTTER.—Factory and Creamery, fresh, in prints, $1/0\frac{1}{2}$ to $1/2\frac{1}{2}$; best Separators and choice Dairies, $1/-$ to $1/1$; fair Dairies and ordinary Separators, 10d. to 11d.; Stores and Collectors, 8d. to 9d.; imported bulk, from 9d. to 11d., for fair to choice new-made.

CHEESE.—Prime new made, 7d. to 8d. per lb.

BACON.—Factory-cured sides, $5\frac{1}{2}$ d. to 6d.; farm flitches, $5\frac{1}{2}$ d. to $5\frac{3}{4}$ d. per lb.

HAMS.—S.A. factory, $7\frac{1}{2}$ d. to 8d. per lb.

EGGS.—Loose, $1/5\frac{1}{2}$ d.

LARD.—Imported, 4d. to $4\frac{1}{2}$ d.

HONEY.—2d. for prime, clear, extracted new season's in 60-lb. tins; bees-wax, $1/1$ lb.

ALMONDS.—Soft shells, $3\frac{1}{2}$ d.; kernels, $8\frac{1}{2}$ d. per lb.

LIVE POULTRY.—Prime table roosters realised $1/9$ to $2/3$ each: good-conditioned hens and fair cockerels, $1/2$ to $1/7$; mixed sorts, 10d. to $1/-$; poor and weedy, 7d. to 9d.; ducks, $1/6$ to $2/6$; geese, $2/6$ to $3/6$; pigeons, 4d. to 6d.; turkeys, $4\frac{1}{2}$ d. to 6d. per lb., live weight, for fair to good table birds.

DRESSED POULTRY is selling well at 5d. to 7d per lb. for fowls and turkeys.

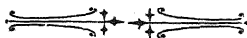
CARCASE MEAT.—Good baconers to prime shop porkers, 3d. to 4d.; chop-pers and stale sorts, $2\frac{1}{2}$ d. to 3d.; prime dairy-fed veal, 4d. to 5d.; fair to medium, $2\frac{1}{2}$ d. to $3\frac{1}{2}$ d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1905:—

Adelaide ...	3.58	Hoyleton ...	3.30	Macclesfield ...	2.93
Hawker ...	2.14	Balaklava ...	3.32	Meadows ...	3.64
Craddock ...	1.71	Port Wakefield ...	3.34	Strathalbyn ...	2.61
Wilson ...	1.73	Saddleshworth ...	3.07	Callington ...	2.14
Gordon ...	1.00	Marrabel ...	3.32	Langhorne's Bridge ...	2.17
Quorn ...	4.49	Riverton ...	3.68	Milang ...	2.41
Port Augusta ...	1.97	Tarlee ...	3.44	Walleroo ...	3.00
Port Germein ...	5.45	Stockport ...	2.71	Kadina ...	4.31
Port Pirie ...	2.95	Hamley Bridge ...	2.20	Moonta ...	3.57
Crystal Brook ...	2.67	Kapunda ...	2.95	Green's Plains ...	5.29
Port Broughton ...	1.81	Freeling ...	2.38	Maitland ...	4.77
Bute ...	2.43	Stockwell ...	2.11	Ardrossan ...	3.07
Hammond ...	2.27	Nuriootpa ...	3.13	Port Victoria ...	3.29
Bruce ...	2.20	Angaston ...	2.70	Curramulka ...	3.23
Wilmington ...	7.39	Tanunda ...	2.66	Minlaton ...	2.60
Melrose ...	6.63	Lyndoch ...	2.68	Stansbury ...	3.17
Booleroo Centre ...	3.45	Mallala ...	3.35	Warooka ...	2.80
Wirrabara ...	2.87	Roseworthy ...	1.99	Yorketown ...	3.15
Appila ...	1.98	Gawler ...	1.86	Edithburg ...	2.47
Laura ...	2.87	Smithfield ...	2.24	Fowler's Bay ...	2.36
Caltowie ...	1.95	Two Wells ...	2.64	Streaky Bay ...	2.30
Jamestown ...	2.48	Virginia ...	2.42	Port Elliston ...	2.52
Gladstone ...	3.03	Salisbury ...	2.46	Port Lincoln ...	4.54
Georgetown ...	3.23	Tea Tree Gully ...	3.14	Cowell ...	3.23
Narridy ...	2.92	Magill ...	5.29	Queenscliffe ...	2.90
Redhill ...	1.37	Mitcham ...	3.19	Port Elliot ...	2.93
Koolunga ...	2.39	Crafers ...	4.71	Goolwa ...	2.09
Carrieton ...	2.54	Clarendon ...	3.99	Meningie ...	1.45
Eurelia ...	2.62	Morphett Vale ...	2.50	Kingston ...	2.74
Johnsburg ...	2.08	Noarlunga ...	1.44	Robe ...	1.58
Orroroo ...	2.17	Willunga ...	2.19	Beachport ...	1.94
Black Rock ...	1.72	Aldinga ...	1.51	Coonalpyn ...	1.48
Petersburg ...	1.87	Normanville ...	1.81	Bordertown ...	1.59
Yongala ...	1.92	Yankalilla ...	2.28	Wolseley ...	1.35
Terowie ...	2.45	Eudunda ...	2.88	Frances ...	1.28
Yarcowie ...	2.34	Truro ...	2.84	Naracoorte ...	1.67
Hallett ...	2.65	Palmer ...	2.08	Lucindale ...	1.31
Mt. Bryan ...	3.18	Mount Pleasant ...	3.17	Penola ...	1.87
Burra ...	2.90	Blumberg ...	3.96	Millicent ...	2.56
Snowtown ...	3.96	Gumeracha ...	4.51	Mount Gambier ...	3.44
Brinkworth ...	3.39	Lobethal ...	3.80	Wellington ...	1.68
Blyth ...	3.44	Woodside ...	3.66	Murray Bridge ...	1.92
Clare ...	4.57	Hahndorf ...	2.94	Mannum ...	1.70
Mintaro Central ...	5.69	Nairne ...	2.65	Morgan ...	1.66
Watervale ...	5.20	Mount Barker ...	3.30	Overland Corner ...	1.94
Auburn ...	3.85	Echunga ...	3.37	Renmark ...	2.29
Manoora ...	4.37				



AGRICULTURAL BUREAU REPORTS.

Richman's Creek, April 17.

PRESENT—Messrs. Knauerhase (chair), J. and J. S. McSkimming, Roberts, Wright, J. M. and H. Kelly, J. H. and F. H. Lehmann (Hon. Sec.), and eight visitors.

STOCK COMPLAINTS.—Considerable discussion took place on this subject, mainly in connection with a recent lecture by Veterinary Surgeon Desmond.

FEEDING AND WATERING HORSES.—In reference to Mr. Desmond's advice to water horses, even if hot, before feeding them, the majority of the members were of opinion that if the water had been exposed to the sun no injury would result. Several members would not allow a horse that was hot to have water cold from the well or tank. Mr. Wright advised giving oats, and not wheat, to horses: the former made muscle, while the latter would fatten the animals. Some discussion on spaying cows and on the fecundity of pigs took place. One member stated that he had a purebred sow, which failed to breed when kept in the pen with the boar. He was advised by a friend to let the sow run in a paddock, and only put her to the boar when she came in season. He tried this plan, and found it successful.

THE DAIRY BULL.—Members wished to know how many cows should one bull be allowed to serve. Mr. Fraser thought that on the large stations two bulls to 100 cows was the usual number. Members would like advice on this subject. [This will depend on whether the service is spread over the whole twelve months. A mature bull will satisfactorily serve 50 to 60 cows; but, if, as is the general practice, there is a heavy strain upon the bulls during certain limited seasons, it would be well to lessen these numbers.—Ed.]

Gawler River, April 14.

PRESENT—Messrs. A. M. Dawkins (chair), H. Dawkins, H. and F. Roediger, Badcock, Kreig, Hillier, Bray, Parker, Baldwin, and Leak (Hon. Sec.), and two visitors.

REMOVING AFTERBIRTH.—Members had found Veterinary Surgeon Desmond's recommendation to inject a bucketful or more of warm water in which a handful of soda had been dissolved effective in removing the after-birth from cows.

EFFECT OF MANURES ON PASTURES.—In reply to question as to whether the feed was greater on land manured with other than mineral super, members reported that they could detect no difference in the after-effect of the different manures.

GRADING SEED WHEAT.—A discussion on the work done by different grading machines took place. The sowing of larger grains and the absence of foreign seeds were mentioned as the main advantages of the grader. The increasing presence of barley in many wheatfields rendered it necessary to sow only clean seed wheat.

Dowlingville, April 20.

PRESENT—Messrs. Mason (chair), Montgomery, Crowell, Whittaker, Grave, Illman, Ward, and Lock (Hon. Sec.).

WORKING STOCK FOR FARM.—Discussion took place on the live stock and implements necessary for working a farm of 600 acres or more in this district, cropping 200-250 acres each year. Mr. Montgomery submitted the following details of stock and implements required:—8 draught and 1 light horses (with 2 foals and 2 yearlings), 2 cows, 100 sheep, 5 pigs, 60 fowls. Of implements:—One 5-furrow plough, set harrows of 6 leaves, 2 cultivators, drill, roller, waggon, tipdray, springdray, horse rake, binder, harvester or stripper, winnower, horseworks (with chaffcutter and corncrusher), 8 sets plough harness, 3 sets dray harness, 3 sets leading harness, a blacksmith's forge, and, at least, £10 worth of small tools. Members agreed that this was a fair estimate of necessities for such a farm.

Nantawarra, April 19.

PRESENT—Messrs. Nicholls (chair), Pridham, Sleep, E. J. and A. F. Herbert, Dall, Rattew, Belling, Bierwirth, and Dixon, and one visitor.

COST OF WHEATGROWING.—After discussion it was resolved that Mr. Coleman's estimate of the cost of growing a bushel of wheat was too low.

ROLLING LAND.—In reply to question, members did not consider it advisable to roll land between seeding and the appearance of the plant. The sifting of superphosphate before putting it in the drill was recommended.

Mount Pleasant, April 13.

PRESENT—Messrs. Lyddon (chair), J. and P. Miller, Tabscott, Maxwell, Royal, Godfree, Thomson, and Vigar (Hon. Sec.), and one visitor.

VETERINARY LECTURES.—Veterinary Surgeon Desmond's lecture at Springton was well discussed, and appreciation expressed by those present of the valuable character of the address.

WHEAT EXPERIMENTS.—Some discussion took place on proposed experiments suggested by the Department of Agriculture. Members advised the use of either Gallant or Gluyas wheats in these tests.

Port Pirie, April 15.

PRESENT—Messrs. Smith (chair), Jose, Crispin, Morrish, Wright, Johns, Hector, and Wilson (Hon. Sec.).

CATTLE TICK.—Mr. Morrish tabled specimens of Western Australian cattle tick, preserved in alcohol.

VISIT TO NEW SOUTH WALES.—Further discussion took place on Mr. Hector's account of a recent visit to New South Wales. In reply to questions, Mr. Hector said that the Young district was well grassed, and produced first-class wool; but sheep did not fatten well. The land selling at £4 was disappointing, and not equal to land in South Australia costing the same price. Sydney, however, was the best market in the Commonwealth for all kinds of produce. He sent his wool to Sydney last year, and he got better prices for it than he would in Adelaide; while it only cost him 1s. a bale more in freight. The selling charges in Sydney were also much lower than in Adelaide. Mr. Morrish said, that, as a rule, good fattening country was not good wool-growing country, and *vice versa*; but Mr. Wright took exception to this statement. Mr. Hector said that, while it was not true of all parts of South Australia, there was some foundation for Mr. Morrish's statement.

DAIRYING.—Mr. Bell forwarded a paper on "The Profit, or otherwise, of Dairying on the Farm." After seven or eight years' experience he had come to the conclusion that, considering the difficulties they had to contend with, such as dry seasons, loss of stock through diseases, the impossibility of growing summer fodder, etc., dairying was not profitable throughout the greater part of the country north of Gawler. This was especially the case since the removal of border duties left them open to competition with produce from the Eastern States. The terrible losses experienced from the disease known as dry bibe imposed too great a handicap on the industry. His experience was that the best milkers were most liable to the complaint, which he attributed to lack of nourishment in the food, due possibly to the poverty of the soil. He was inclined to believe that rearing calves on separator milk, without adding something to replace the cream extracted from it, was often the real foundation of the complaint.

Morphett Vale, April 18.

PRESENT—Messrs. Christie (chair), Cain, Jones, Perry, and Anderson (Hon. Sec.).

BLOAT OR HOVEN.—In cases of hoven in cattle, the Chairman advised putting a rubber tube down the throat, to permit of the escape of the gas.

FOXES.—These vermin were reported to be increasing, and members feared they would become a serious nuisance.

Johnsburg, April 15.

PRESENT—Messrs. Masters (chair), Caughlan, Dunn, Potter, Chalmers, Smith, Luckratt, and McRitchie.

F.A.Q. WHEAT STANDARD.—Discussion on this subject took place. Members thought farmers, as a body, were coming to recognise that a high f.a.q. standard was not beneficial to their interests, as it gave buyers a means of lowering the average price by docking for under-standard samples. The prices realised for New South Wales and Victorian wheat in London were commented on in connection with the lower standards adopted by buyers in those States.

STOPPAGE OF WATER IN HORSES.—This trouble was reported to be prevalent in this district, and some discussion on the treatment of affected animals took place. Mr. Chalmers stated that he gave one horse saltpetre, then aconite, without relieving it. He then gave a teaspoonful of laudanum, repeating the dose a few hours later, with the desired result. Some of the members objected to laudanum as dangerous. Mr. Dunn said water stoppage was often caused by colic. He found saltpetre a good medicine in the early stages; but if this was not successful, he would apply cantharides, and in very bad cases give 20 drops of nux vomica. Mr. Luckraft advised the application of very cold water to the loins for a horse attacked by colic or gripes. [For treatment of this trouble, see Veterinary Surgeon Desmond's article in January *Journal of Agriculture*, page 311.—Ed.]

Redhill, April 18.

PRESENT—Messrs. Robertson (chair), Darwin, Wake, Nicholls, Wheaton, Steele, Kelly, Stone, D. and J. N. Lithgow (Hon. Sec.), and one visitor.

SEEDING.—Mr. Kelly initiated a discussion on this subject. He preferred to start the preparation of the land the year before he fallowed by keeping the grass fed bare by sheep. He would fallow lightly, and keep the land well worked, to encourage seeds of rubbish to grow, so that it could be well cleaned. When ready for seeding, sow with drill up to 75 lb. of seed per acre. He advocated grading wheat intended for seed. In reply to question *re* formalin as a pickle, Mr. Wheaton stated that he had used it at the rate of 2 ozs. to 3 bags of seed with success. Members agreed that heavier seeding was becoming more general, as the thicker crop had a tendency to keep down the weeds.

Quorn, April 15.

PRESENT—Messrs. McColl (chair), Rowe, Smith, Noll, Cook, Brewster, Patten, Toll, and Walker (Hon. Sec.).

IRRIGATION RESULTS.—Mr. Cook tabled splendid specimens of onions grown with the aid of irrigation.

VETERINARY LECTURE.—Considerable discussion took place on main points of lecture recently given by Veterinary Surgeon Desmond. Members were of opinion that occasional lectures, such as those delivered in Quorn by Messrs. Desmond and Suter, were of great value to the farming community.

Amyton, April 20.

PRESENT—Messrs. Kelly (chair), Bourke, Wheadon, Hughes, T. and W. Gum (Hon. Sec.), and one visitor.

DOES WHEATGROWING PAY?—The Hon. Secretary initiated a discussion on this subject. He contended that in this dry district wheatgrowing of itself would not pay, but in combination with other lines of production a living could be made. They had depended too much upon wheat, and had not given sufficient attention to other products. The majority of members agreed with the Hon. Secretary, some, however, quoting figures to show that at one time a living could be made out of wheatgrowing.

Bagster, April 15.

PRESENT—Messrs. Freeman (chair), Roberts, Hayes, Stiggants, C. F., and E. Brown, Payne, Basham, and Gravestocks (Hon. Sec.).

PICKLING WHEAT.—Mr. Stiggants read a short paper on this subject, and considerable discussion ensued. Members were generally of opinion that dipping the seed in the pickle was better than pickling on the floor.

MANURES.—Some discussion on manures took place, and the Chairman gave members the benefit of his experience.

SALE OF WHEAT IN ENGLAND.—Members wished to know whether South Australian wheat was sold in England at 60 lb. to the bushel, or at the standard fixed by the Chamber of Commerce. [Though sometimes quoted on Mark Lane at 62 lb. per bushel, South Australian cargoes of wheat are sold per quarter of 480 lb. (8 bushels). The sample, as adopted by the Chamber of Commerce, is forwarded to the different trading centres in England, and any dispute as to the quality of the wheat is decided by comparison with these samples.—Ed.]

Lipson, April 15.

PRESENT—Messrs. Provis (chair), Swaffer, Bratten, Baillie, and Barraud (Hon. Sec.), and one visitor.

PICKLING SEED.—In reply to enquiry, members stated that they had not tried formalin pickle as a preventive of bunt. Most of the members would pickle cat seed every season, instead of every other year, as suggested by one member. In pickling seed by dipping, Mr. Bratten advised using a new solution of bluestone for each bag, instead of putting a number of bags of seed in the same solution.

COST OF WHEATGROWING.—Mr. Bratten tabled the following balance-sheet in connection with the cropping of 90 acres of land, all the work being done with hired labour:—

INCOME.		EXPENDITURE.	
671 bushels wheat, at 3s.		Ploughing, at 3s. 6d. per	
2½d.	£107 12 9½	acre	£15 15 0
12 bags screenings	4 4 0	Rolling, at 1s. 6d. per	
Stubble, at 3½d. per acre ...	1 2 6	acre	6 15 0
Hay cut on roads for strip-		Harrowing, at 6d. per	
per	2 0 0	acre	2 5 0
		Manure	11 13 3
		Rent	9 6 0
		14 bags seed wheat	9 2 0
		Bluestone	0 2 11
		Reaping	13 10 0
		Bags	4 11 0
		Cleaning, at 6d. per bag	8 1 0
		Cartage	2 13 8
		Part instalment for net-	
		ting	0 17 0
		Balance	30 7 3½
Total	£114 19 3½	Total	£114 19 3½

Meadows, April 25.

PRESENT—Messrs. Pearson (chair), Usher, Clatworthy, W. J. and C. E. Stone (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—Members met at Mr. W. J. Stone's homestead, at Bull's Creek, and inspected the orchard, which contains a good collection of apples. The crop this season was fairly good, and codlin moth was very scarce. Different members gave practical demonstrations to illustrate their views on the pruning of fruit trees.

WASHAWAYS ALONG CREEKS.—Owing to the heavy rain the previous day the creek came down in flood, and washed away portion of the flat. Discussing this damage, members suggested that if more attention was given to keeping drains and creeks free from rubbish there would be less loss through soil washes.

Millicent, April 13.

PRESENT.—Messrs. McRostie (chair), Holzgreffe, Lindsay, Mutton, Oberlander, Harris, Hart, and Campbell (Hon. Sec.).

NARACOORTE CONFERENCE.—Messrs. Holzgreffe and Campbell reported on proceedings of Naracoorte Conference.

DRY BIBLE.—Some discussion on this subject took place. Two members stated that they had never experienced any loss from this complaint. They made it a practice to grow green feed throughout the year for their cows. Two other members had never heard of losses where green feed was regularly provided. Mr. Mutton said this being the case, he could not understand why cattle suffered now more than formerly. His father worked his bullocks for years on little else than dry feed, without any losses.

BIRD SCARERS.—Mr. Davidson described some of the most effective of these contrivances. Members thought that feathered pests in this locality must be less sensitive than in others, as none of these mechanical contrivances were effective in frightening them.

PASTURES.—Mr. Holzgreffe advised sowing seed of grasses, etc., on stubble land which it was intended to leave out to pasture for a few years. He had treated a hundred acres in this way, using a considerable quantity of trefoil. This, though expensive seed, paid well to grow, and cultivation does not wholly destroy it. Grasses did splendidly after a cereal crop manured with super. Messrs. Hart and Stuckey supported the above suggestion.

Longwood, April 29.

PRESENT.—Messrs. Oinn (chair), Antuar, Vogel, Nicholls, and Hughes (Hon. Sec.), and five visitors.

MYLOR TYPICAL ORCHARD.—Mr. H. R. Antuar read a paper on the objects and work of the Typical Orchard. He believed that sooner or later the State would derive great benefit from this Orchard, and he thought it the duty of fruitgrowers to make the best use of it. Up to the present there has been little or no chance to learn much, as there has been very little fruit to see; but now that the trees were coming into bearing the fruitgrowers should be afforded the opportunity to learn all they could about the different fruits. He feared this past year had been wasted, as, so far as anyone knew, no record was kept of the dates the different fruits ripened, and, from the appearance of the samples in the Economic Museum at the Botanic Garden, much of the fruit was picked too early. If a grower wanted a new variety of apple for export, or one that fills a gap in the local supply, or one to replace a variety too subject to disease, he could not go to the Mylor Orchard for the information, as he could not afford the time to carefully examine a collection of 1,400 varieties. He thought, therefore, that next season a competent man should be put on to take record of the time of ripening, freedom from disease, appearance of both tree and fruit, the quality, etc., of the fruit of every variety. This information, if tabulated and published, would be of great value to fruitgrowers. Cuttings should be available for distribution, and he would suggest that a charge be made for them. Members were of opinion that samples of fruits should be kept at the Orchard, where the trees which produced them could be inspected, and that the date of gathering should be placed on the ticket with the name of the variety. Growers would then be able to compare them with known varieties, and also judge their keeping qualities. Fine samples of apples and pears were tabled by different members. Some discussion on cider took place, reference being made to the complimentary remarks of the judge on cider shown at Chamber of Manufactures' Exhibition.

RINGING APPLE TREES.—Two instances were cited where Nickajack apple trees, which had failed to set a good crop, had fruited well after being rung.

CORELESS APPLE.—Members wished to know if there was any evidence of the accuracy of the statement that the codlin caterpillar must eat the pips of apples or pears to be able to mature and propagate its species, as, if not, the so-called coreless apple was not likely to be of much use. [There is no proof that the pips of the fruit are necessary to the well-being of the codlin moth, though a fully-developed caterpillar usually eats some of the pips before it voluntarily leaves the fruit.—Ed.]

Onetree Hill, April 13.

PRESENT—Messrs. Ifould (chair), Blackham, Blake, Cowan, Flower, Smith, and Clucas (Hon. Sec.).

STANDARD BUSHEL.—This subject was again discussed. Mr. Blackham presented a calculation showing to what extent the farmer benefited from the sale of a good sample, as compared with an inferior one. Members generally held that the main object of the farmer was to produce the maximum of yield, and that high quality of the sample was a secondary consideration. Mr. Summers' article, in the opinion of members, put the case very clearly, and bore out what the members of this Branch contended for.

DAIRYING.—Mr. Geo. Bowman reviewed Mr. P. H. Suter's lecture at Gawler. It was generally agreed that the cost of feeding on the lines recommended by Mr. Suter was excessive. Mr. Flower tabled samples of English and Australian meadow hay. In regard to cutting chaff, it was agreed that for general purposes it was better to cut chaff to $\frac{1}{2}$ -inch lengths than either longer or shorter. Feeding lucerne ensilage without some other class of food was a decided mistake. Tub silos were favourably commented on. In regard to making lucerne hay, members pointed out that the operation was always attended with considerable loss of feed, and it was better to convert the lucerne into ensilage.

Woolundunga, April 1.

PRESENT—Messrs. Barrett (chair), Prosser, Smoker, Greig, Partridge, Becker, and Rogers (Hon. Sec.).

COTTON.—Mr. Becker showed splendid samples of cotton grown about two miles from Stirling North. Seed should be planted about September, after danger of frost has passed, and the plant could, in ordinary seasons, be grown without irrigation.

SHEEP.—Mr. Barrett read a paper on "The Farmer's Sheep."

Kingscote, April 10.

PRESENT—Messrs. Turner (chair), Melville, Dewar, C. J. and P. T. Bell, Ayliffe, Hawke, and Cook (Hon. Sec.), and one visitor.

SHEEP ON THE FARM.—Mr. C. J. Bell read a short paper on "The advantages of keeping Sheep on small holdings." He was satisfied that they could make considerable profit by purchasing good sheep off shears, and selling them as fats. For two or three months these sheep could be kept on the fallow, and after harvest on the stubbles, when they would soon get fit to sell. On the small holdings it would pay better to buy off shears than to attempt breeding; but with a larger holding of well-grassed land, lamb-rearing will pay. He would mate good Merino or crossbred ewes with a large Shropshire ram. Good feed must be kept for the lambing ewes, in order to give the lambs a good start. His own holding was too small to keep more than a few sheep; but last year he bought 50 good store lambs at 5s. each. Finding he had too many for his paddock, he sold 25 a little later on at 7s. 6d., and killed the others as required for mutton. This kept the house going for nearly 12 months, while the skins averaged 3s. each. The transaction, though very small, was profitable, inasmuch as the mutton consumed cost nothing, sales of sheep and skins more than covering first cost of sheep.

BARLEY.—Some matters connected with the growing of malting barley were discussed.

Mount Remarkable, April 13.

PRESENT—Messrs. Casley (chair), Challenger, Yates, Morrell, Smith, and O'Connell (Hon. Sec.).

BUSINESS.—General discussion took place on cost of growing wheat, diseases amongst stock, noxious weeds, and vermin. The losses of stock from impaction, or dry bible, were referred to, the complaint being somewhat prevalent in this district. The damage by starlings, which are very numerous in the district, was also mentioned, and the necessity for united action to destroy the birds was urged.

Bute, April 18.

PRESENT—Messrs. Trengove (chair), A. and H. Schroeter, Stevens, Sharman, Buchanan, and McCormack (Hon. Sec.).

SEEDING.—The Chairman read a short paper on "Some Stray Thoughts on Seeding Operations." Most of the land to be sown in this district was fallow, and he advised starting seeding about the middle of April, finishing by the end of May. The land should be got as clean as possible before sowing; the farmer who merely drilled in the seed without first working the fallow was courting failure. The implement they stood most in need of was one to quickly and effectively prepare the fallow for drilling. Some of the imported implements so extensively sold were not effective destroyers of weeds, and re-ploughing, though effective, was likely to cause takeall. He strongly recommended farmers to employ the best of labour only. A really reliable man was worth a good wage, while a cheap hand usually proved an expensive one. Their machinery and implements were too costly and complicated to trust to any but a good worker. He advised pickling all seed with formalin or bluestone. Of the varieties tried in this district, Marshall's No. 3 and Gluyas had given best results. Mr. A. Schroeter had used the spring-tooth cultivators on the fallows for destroying weeds, but was not satisfied with their work. He believed the best way to clean the fallow prior to seeding was to re-plough it very shallow.

GRADING SEED.—Messrs. Schroeter reported having purchased a Perfection grader for cleaning their seed wheat, and were satisfied that it was a very valuable machine for the farmer.

Brinkworth, May 9.

PRESENT—Messrs. McEwin (chair), Aunger, Heingus, Coombe, and Stott (Hon. Sec.).

COST OF WHEATGROWING.—This was discussed, and it was resolved that, in the opinion of this Branch, with wheat at 3s. per bushel, wheatgrowing alone does not pay. The following statement of cost per acre of growing wheat on fallow in this district was considered a fair one:—

	£	s.	d.
Ploughing	0	6	0
Harrowing	0	0	9
Cultivating (twice)	0	6	0
Drilling in seed	0	2	0
Seed (1 bushel)	0	3	0
Manure (84 lb.)	0	3	6
Harrowing	0	0	9
Rent (2 years at 3s. 6d.)	0	7	0
Reaping	0	4	0
Winnowing (12 bushels at 1½d.)	0	1	6
Carting to rail (3d. per bag)	0	0	9
3 bags (at 6d. each)	0	1	6
Total	£1	16	9

With a 12-bushel crop this is 9d. per acre above the returns. The above does not in any way consider other sources of income.

Calca, April 22.

PRESENT—Messrs. Plush (chair), Wilcott, Smith, Bowman, Thomas, Freeman, and Newbold (Hon. Sec.), and two visitors.

FORMALIN.—Mr. Freeman reported that, through a mistake, one of his horses was given some barley which had been dipped in a strong solution of formalin, but fortunately no injury resulted.

SEEDING.—Discussion took place on the question of the wisdom of sowing in windy weather. Members were of opinion that the super was blown away, and that the wheat did not get the benefit of the manure. Some of the members thought it was advisable to stop drilling when it was very windy.

Dawson, April 20.

PRESENT—Messrs. Warner (chair), Collins, Meyer, Schebella, Kilderry, Severin, and Just, and three visitors.

STANDARD BUSHEL.—Considerable discussion on this subject took place, most members favouring a 60 lb. standard. The fact that the New South Wales farmer got as much for his 59½ lb. wheat as the South Australian did for his 63-lb. sample was, in the opinion of members, evidence that something was amiss. One of the visitors strongly opposed the proposal for a 60-lb. standard. This season his wheat went 68 lb. to the bushel, and he felt quite satisfied to dispose of it under the present standard. Members expressed the opinion that the merchant had much better reason to be satisfied with this transaction. If wheat were paid for according to quality, a high standard would be welcomed by farmers.

Kingscote, May 8.

PRESENT—Messrs. Turner (chair), Burgess, Melville, Olds, Wright, Dewar, and Cook (Hon. Sec.).

BUSINESS.—The members who had agreed to read papers being absent, nothing much was done. Mr. Wright tabled specimen of what is known as "native bread," an edible fungus of curious form. Some discussion on proposal to impose heavy duties on imported agricultural implements took place, most of the members opposing the duty, which, in their opinion, would have to be paid by the farmers.

Clarendon, May 8.

PRESENT—Messrs. Payne (chair), Piggott, Dunmill, Morphett, Pelling, Harper, W. and J. Spencer, and Wright (Hon. Sec.), and one visitor.

FRUITGROWING.—Mr. W. A. Morphett read a short paper, in which he advocated the growing of apples by small holders in this district. Many kinds of fruit, such as apricots, peaches, and plums, can also be grown successfully; but they should not produce too much of these soft fruits, as the local market was easily glutted. Apples did as well here as in any district, and as there was a good demand for export purposes, it would pay to plant a few trees. It was resolved that, in the opinion of the Branch, it would pay owners of suitable land to plant a few hundred trees of the right sorts.

Davenport, April 13.

PRESENT—Messrs. Trembath (chair), Hewitson, Roberts, Holdsworth, Bothwell, Hodshon, Pryor, McDonald, and Lecky (Hon. Sec.), and eight visitors.

TOWN & COUNTRY LIFE.—Mr. T. Hewitson gave a very interesting lecture on this subject, dealing with the privileges and drawbacks of both town and country life.

CAPPED ELBOW.—Mr. McDonald said he had a horse suffering from "capped elbow," and would like to have reliable advice as to any effective treatment of this unsightly defect. He thought a surgical operation would be necessary. Mr. Lecky agreed, and stated that the trouble was due to bad shoeing, i.e., too high heels. The services of a veterinary should be obtained. [Veterinary Surgeon Desmond states that to effect a cure an operation would be necessary.—ED.]

Morphett Vale, May 16.

PRESENT—Messrs. Hutchison (chair), E. and J. Perry, Jones, Hunt, O'Sullivan, and Anderson (Hon. Sec.).

HAY MANURING.—Discussion on proposal to experiment with different manures for hay crops took place, and the Hon. Secretary agreed to take charge of the work.

FOXES.—Members reported that several foxes had been seen lately in the district, and losses of lambs were reported.

Mount Pleasant, May 12.

PRESENT—Messrs. Phillis (chair), Lyddon, Godfree, J. F. and P. Miller, Thomson, Giles, and one visitor.

FOXES.—Discussion on damage by foxes took place. Serious losses of lambs and poultry were reported, and it was agreed that some action on the part of stockowners was necessary.

Morchard, May 13.

PRESENT—Messrs. Scriven (chair), McDougall, Kirkland, Toop, Kupke, Kitto, and Beck (Hon. Sec.).

WESTERN AUSTRALIA.—Mr. J. B. McDougall, who has recently returned from the sister State, gave an interesting account of his trip. To the majority of South Australian farmers much of the land appeared poor in character, but the crops produced were abundant proof that the land was much better than it looked. Specimens of soil, of wheat, poison bush, and timber were shown.

Penola, May 13.

PRESENT—Messrs. Alexander (chair), Miller, Kilsby, Worthington, Stoney, McKay, and Peake (Hon. Sec.).

KALE AS A FODDER CROP.—Mr. F. W. Kilsby read a paper describing his experience in growing kale in this district. In August, 1902, he sowed kale on about 5 acres of land, applying 4 lb. of seed and 90 lb. of superphosphate per acre, with an ordinary seed-sower. In early spring, when the plants were about 9 in. in height, he cultivated between the rows, which were about 2 ft. 6 in. apart. Where the scarifier did not reach, the weeds were hoed up and the kale was also thinned out in places. The cost of ploughing, drilling, seed, manure, and cleaning came to about 17s. per acre. In January, 1903, he put 125 sheep on the paddock for three weeks, but as the kale was growing too strong for them he put on another lot of 600 until they fed it down, which took two or three weeks, when they were all removed. The plants made rapid growth again, and stock were put on once more to eat it down. The sheep did remarkably well, not only when on the kale, but on the grass afterwards. This patch of kale must have carried equal to 15 to 20 sheep per acre for the whole year, and even the second year carried four to five sheep per acre, where formerly the land only carried one and a half sheep. In 1903 he fattened 1,500 sheep on about 1,000 acres of land, in addition to which there were a number of store sheep, and much of the success was due to this small paddock of kale. In addition to the kale he sowed a few acres to turnips. This crop also did well, some of the roots weighing up to 12 lb. Sheep and cattle became very fond of these, but on the whole appeared to prefer the kale.

Davenport, May 11.

PRESENT—Messrs. Trembath (chair), Hewitson, Hodshon, Roberts, McDonald, Kingham, Bothwell, and Lecky (Hon. Sec.), and twenty visitors.

THE RABBIT AS FOOD FOR THE MILLION.—Mr. A. McDonald read a paper on this subject, to the following effect:—Much has been said and written about the rabbit problem, and that it is a serious one nobody can deny, but the first problem to be solved is:—"Is the rabbit a curse or a blessing?" It has occurred to me that we Australians began at the wrong end by hastily writing him down as a liability, instead of first using every means in our power to place him on the other side of the ledger as an asset. When it is proved beyond a doubt that he can only be regarded as an incubus, we must get rid of him at all costs; but if, on the other hand, it can be demonstrated that he is a valuable asset, then his wanton destruction should at once cease. I do not intend going into a lengthy description of the rabbit; the average Australian knows him on sight. His occupation of this country without con-

tributing to his support signifies a great deal to the landholder and to the State generally, and as all efforts to permanently exterminate him have proved futile, there seems to be little doubt but that he has come to stay. It therefore behoves us to think seriously if we are not flying in the face of Providence by treating as vermin good wholesome food, which would be appreciated by the starving people of other continents. To turn the rabbit into food for the million—cheap, wholesome, and palatable food—food which will keep for any reasonable time, and be manufactured without the aid of expensive and intricate machinery, is the key to the problem of making him a “valuable national asset.” How to do it. First catch your rabbit alive—any trapper knows this part of the business, which needs no explanation. When caught, treat him gently; do not knock him about, or you will bruise the flesh. Kill by a smart rap behind the ears with a short bludgeon. I have seen some people kill by beating the head on the ground, which is a slovenly way, besides being unnecessarily cruel. The killing, as well as every other part of the process, should be done neatly. Skin, dress, and open out perfectly flat by cutting through the ribs, then wash and cleanse thoroughly with clean water (salt water will do). Whilst quite fresh put into brine made strong enough to float an egg, and leave it there ten hours; then remove, drain and dry, after which transfer to the smokehouse. Perhaps a few hints about the construction of a smokehouse for smoking the rabbit may be useful. Make an excavation in the ground 3 or 4 ft. deep; from two sides of which excavate trenches to same depth, with a width of 18 in., and length of 4 ft.; cover your trenches with sheets of iron. Over the hole place a box, 3 ft. high, having both top and bottom knocked out, with ordinary fencing wires fixed at each end, and running through it. Use the spare boards to make a secure cover. Hang the meat on the wires, put the lid on top of the box, light the fire at one end of each trench, and the smoke does the rest. The finished product you can inspect for yourselves and judge if it is, or is not, a wholesome and palatable article of food. Anyhow, there can be no two opinions as to its cheapness and the ease with which it is treated. It will also be evident to anybody that the saving in carriage alone will be considerable, the weight of the smoked specimen being only $1\frac{1}{2}$ lb., against 2 lb. 2 oz. of an average one in the green state. Further, trappers may utilise every carcass fresh, thus avoiding the loss of a very large percentage of their catch, which, under present conditions, are rejected as unfit for use when they reach the nearest market. But the principal advantage is that the industry can be manipulated and carried on by any and everybody in the far away back country where the rabbit abounds and no quick means of transit exists. Providing a market is found for the smoked article, the trapper may be sure of his produce reaching market in good condition, even though it takes months to get there. The number of rabbits sent to the Government Cool Stores, Victoria, for the month of January, 1905, totalled over three quarters of a million, of which 26 per cent. were rejected as unfit for export. If such a number can be collected in a single month in a State such as Victoria, which has not large tracts of unoccupied country such as we have, then it does not require any very great stretch of imagination to suppose that a depot at Port Augusta could gather at least half a million smoked rabbits monthly, which, if worth only 2d. each carcass, would represent over £4,000 cash. I would suggest that squatters, farmers, and others co-operate with the Branch of the Bureau and forward a trial shipment to some good commercial firm in Great Britain, and thus test the practicability or otherwise of obtaining a market. The outlay in the event of failure would be small and the possibilities of success great. Mr. McDonald tabled two rabbits treated in the way described, also a cooked sample, which was tasted by members, and very highly praised. In reply to questions, Mr. McDonald stated that all the plant required by two men to undertake this business would be the ordinary trapping appliances, a supply of salt (it must be good), a tub, and the box for smokehouse. The fire did not in any way touch the carcass, the smoke was practically cold, and he was satisfied the samples shown were thoroughly cured. He used deal sawdust for creating the smoke, but small chips would answer the purpose equally well. For transport the cured rabbits could be packed in the same way as salt fish. The methods of cooking were merely questions as to taste. The carcass should be cleaned as soon as possible after trapping the rabbits, though during the cold weather there was not the same necessity as in the summer for putting them immediately in the pickle. Members congratulated Mr. McDonald on the result of his work, and generally appeared to agree that the cured article was attractive and tasty and likely to meet with favour. A hearty vote of thanks was accorded to Mr. McDonald.

Cherry Gardens, May 16.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Brumby, Partridge, Currow, Hicks, Jacobs, and Ricks (Hon. Sec.).

HAY CROPS.—In reply to question as to whether oats or wheat was better for hay on new land not fallowed, members thought oats were preferable in this district.

DAIRYING.—At previous meeting, Mr. P. H. Suter gave an address on dairying, and the lecture formed the subject of considerable criticism. Mr. Jacobs did not agree with Mr. Suter's view that if cows were fed regularly on green fodder or ensilage they would not be affected by the disease known as "dry bible."

Crystal Brook, May 13.

PRESENT—Messrs. Hamlyn (chair), Sutcliffe, Robinson, Venning, Solomon, Dabinett, Hutchinson, Pavy, Kelly, Billingham, Western, Clarke, Forgan, and Symons (Hon. Sec.).

MANURES FOR WHEAT.—In reply to question, the Chairman stated that he had found 60 lb. per acre the best quantity of super to use in this district with wheat.

NITROGEN BACTERIA.—Mr. Dabinett read extract dealing with the nitrogen-gathering bacteria, and the benefits derived from their work.

THE ADVANTAGES, OR OTHERWISE, OF COUNTRY LIFE.—At previous meeting Mr. H. Billingham read the following paper on this subject:—In his speech before the conference of teachers in 1903 Mr. Justice Gordon made use of the following quotations:—1. From the pen of Mr. Rider Haggard: "No question of the day is more neglected and thrust aside than the flocking of population from the fields to the cities, and yet none is more important. It means that the character of the race is changing; it means that their physique is deteriorating; it means that fewer men of the best class are available for national defence; it means the crowding together of vast hordes of people, who, at the first breath of panic or serious depression of trade, will cease to be able to earn their livelihood, and will have to be supported or controlled." 2. Another eminent writer: "Nature shows man that he cannot live apart from her; that he requires the field, as the fish require water. Man recognises that he sinks lower and lower when he forsakes the soil; that the farmer is the only one who remains healthy and strong; while the city saps the very marrow in the bones of its inhabitants, rendering them unfruitful and liable to disease, so that each family absolutely rots out in two or three generations. The city would become in 100 years an enormous cemetery, without a single living being within its walls, if it were not that there is a constant influx of people from the country to fill up the ranks left vacant by death. In spite of their knowledge and appreciation of these facts, men continue to abandon the fruitful fields and flock to the cities, to tear themselves away from life, and throw themselves into the arms of death." The first question that comes to our minds as we ponder these words will, I think, without doubt, be: "Why do people crowd to the cities?" The replies are, of course, various—"To make a fortune"; "To enjoy the advantages of social intercourse, pleasure, amusement, and variety"; "There is no scope for the intellect in the country"; "Wages are too low." My purpose is to analyse these reasons, and I think we shall see that the advantage will lie in favour of the fields. "Country people go to town to make their fortunes." Now, I strenuously maintain that of those people in the great cities who do succeed in forcing their way to the front in the interminable fight for wealth, by far the greater number are those who hail from the farming districts; but these are only the few—the lot of the many is not so good. A man has to labour for a barely living wage, pay high rent, spend an over-large proportion of his income upon wearing apparel, "to keep up appearances," such as town society demands of its members; he has to purchase every single necessity of life (for, having cut himself off from Nature, Nature will do nothing for him), to live in less healthy surroundings, and bring up his family in cramped dwellings, and turn them into the streets for a playground. By the time he approaches old age, where is the fortune? He will have found that it has taken all his income to keep things going, and any who may have amassed even a moderate competence will be far more fortunate than the majority of his fellows, but will have purchased that com-

petency at the cost of the one thing of all others that makes life bearable, his health. He will find that the struggle upwards "a more than human weight upon his frame has cast." Wordsworth, on this point, says:—

"The world is too much with us; late and soon,
Getting and spending, we lay waste our powers;
Little we see in Nature that is ours,
We have given our hearts away! a sordid boon."

Meanwhile, the countryman has pursued the even tenor of his way, and a youth of labour is crowned with an age of ease. "Country people flock to towns for social intercourse, pleasure, amusement, and variety." And they get them.

"And e'en while fashion's arts decoy,
The heart, distrusting, asks if this be joy."

For social intercourse too often leads to the card table, the hotel bar, gossip, and immorality. It always leads to a blunting of the sharp points of duty, honour, and rectitude. Pleasure and amusement lead to the spending of money better turned to other directions, waste of time, deadening of the intellect, sloth, unfitness for the daily task, until at last "the toiling pleasure sickens into pain," for "the pleasure-house is dust." Variety becomes tiring and wearisome. Where crowds live we find

"Evil tongues, rash judgments, sneers of evil men,
And greetings where no kindness is."

On the other hand, will the country dweller find no intercourse, no pleasure and amusement, no variety? I rather think so. He will find a truer friend than if he had the whole world at his feet—"Nature, a mother kind alike to all," the highest and best of teachers, and the most constant companion. What says Dr. Johnson to a dweller in the country?—

"There every bush with Nature's music rings,
There every breath bears health upon its wings;
On all thy hours security shall smile,
And bless thine evening walks and morning toil."

Nature's is no evil tongue; she will not sneer, nor will her greeting be without kindness. No countryman need ever be lonely if he will take this mother's outstretched hand, and listen to what she will teach him by the floating cloud, the sighing wind, the murmuring stream, the rustling tree, the growing plant, the blossoming flower, the gorgeous sunset, the sparkling dewdrop, the humming insect, or the singing bird. Nor will he want for pleasure, amusement, or variety, for all these things will not only keep him from being lonely, but will provide him with an interest ever widening and ever increasing. For his daily round the poet tells us

"The cock's shrill clarion will rouse him from his lowly bed."
"Cheerful he wakes, breasts the keen air, and carols as he goes."

"At peep of dawn he brushes, with hasty steps, the dews away, to meet the sun upon the upland lawn."

Later—

"How jocund does he drive his team afield."
"He hears the birds their morning carols sing."

During the day

"His best companions innocence and health,
And his best riches ignorance of wealth."

Returning home in the evening he sees the dazzling sunset, with all its wonderful tints, from shining gold to glorious purple: he feels the hush when "all the air a solemn stillness holds"; enjoys his frugal meal, savoured with the best of all sauce, hunger; and rejoices that

"Something attempted, something done,
Has earned a night's repose."

Then the changing seasons bring him variety enough—and variety, moreover, that never palls, but is always both refreshing and welcome. In the spring, Shelley says:—

"The ants, the bees, the swallows reappear,
Fresh leaves and flowers bloom,
The amorous birds now pair in every brake,
And build their mossy homes in field and tree;
Green lizard and the golden snake,
Like unimprisoned flames, out of their trance awake."

In summer he sees his crops ripen, and the golden harvest brings reward for labour. Autumn brings him the luscious fruits of vineyard and orchard, and even chilly winter is not without its joys and its health-giving labours. "Country people flock to towns because they find no scope for intellect." Granted, the advantages of education appear to be all in favour of the towns. All the best schools, academies, and universities are there. But is there no room for our best intellects in the country? Science has done much for all branches of business in late years; but I venture to say that she has not found a better, safer, or more interesting field than in the business of the primary producer, *e.g.*, the separator has revolutionised the dairy trade, agricultural machinery has made it possible for the world to be supplied with all necessaries at a cost satisfactory to the consumer and payable to the producer. Fertilisers have considerably raised the yield per acre. Yet, great service as science has already rendered agriculture, that service is as nothing compared with the possibilities which lie beyond, *e.g.*, the inoculation of seed and soil by nitrogen-bearing bacteria, and the production of a spineless, thornless cactus, which is a succulent and nourishing fodder for cattle, and which will grow in the most arid desert. Surely the outlook in this direction is infinite. Finally, "the wages question." Men who have had experience as workers, both in town and country, have told me that the man working for a farmer at 10s. per week is far better off as the result of a year's work than one working in factory, shop, or office. The same writer that I have before quoted says:—"The wages receiver must work an increased number of hours to get enough to eat. Fruit and vegetable gardens show us what a wealth of provisions can be produced on the tiniest scrap of land. Experience teaches us that man's labour can nowhere be employed in a more lucrative way than in agriculture. It is found that a plot of ground of incredibly small size is sufficient for a man's support." Need more be said to show that, from any point of view, a man is more than unwise if he resort to the stuffy and close quarters of a town instead of planting his foot more firmly in the soil, and remaining for ever the companion of that beneficent mother, Nature? [This paper is published by special request of the Branch. Such papers—more of a literary than of scientific or practical nature—are not altogether suitable for an agricultural journal, and it is only occasionally that we can provide space for such.—ED.]

Mallala, May 1.

PRESENT—Messrs. W. Temby (chair). S. Temby, Wilson, Jenkins, Loller, Nairn, Marshman, Murphy, Hancock, McCabe, and Nevin (Hon. Sec.), four hon. members, and two visitors.

LOSS OF LAMBS.—Mr Marshman reported loss of nine summer lambs. They were feeding in a stubble, and died very suddenly, the carcasses being much swollen.

FRUITGROWING.—Mr. S. Temby read a short paper on "Growing Fruit on the Farm." He advised working the land well previous to setting out the trees. For small gardens, handy one-horse cultivators can be secured at small cost. When planting, care should be taken to spread the roots out well, and to cover them with fine earth. Press this well down, then fill up the hole without further pressure. If necessary to stake the trees, care must be taken not to injure the roots. The trees should be headed back well, say to about 18 inches, and, with most stone fruits, if one-year-old trees, cut all the side shoots back. The removal of surplus shoots during the spring, and pinching back where advisable during the summer, were important factors in getting good-shaped trees. He would plant trees 15 feet to 20 feet apart, and 20 feet between the fence and the nearest trees. Some quick-growing shrub should, where possible, be grown as a breakwind. Paper was discussed, the general opinion of members being, that to properly attend to fruit trees would require more time than most farmers could spare. From the utility point of view, they thought vegetables would be of more service.

Virginia, May 15.

PRESENT—Messrs. Hatcher (chair), Strempel, J. E. and S. J. Taylor, Baker, Johns, Thompson, Huxtable, Odgers, Nash, Pavy, and Ryan (Hon. Sec.).

SOURSOP.—Mr. J. E. Taylor read a short paper on the "Soursop" (Oxalis). It was to be regretted that those who introduced this weed were not better acquainted with its habits. For a number of years the weed was a source of considerable anxiety to him, and he made unavailing efforts to get rid of it. He did not, however, intend to worry about it in the future, as he found his sheep were very fond of it, and, as it starts early and grows quickly, they often got a bite from it before other feed was available. He had seen his sheep scratch the ground away to get at the stems under the soil. They were also very fond of the flowers after they had been open for a few days. Ewes feeding on the soursop appear to yield good milk, as the lambs thrive. He had also found that it was possible to grow good wheat crops on land infested by soursops. Owing to their deep-rooting habit, and the quantity of matter that would decay, they probably benefited the soil. In this district they could be buried deeply when ploughing, so that the drill hoes would not bring them to the surface again. On fallow land, where they are thick, it is an advantage to cut them off with the cultivator. He found it best to sow an early-maturing wheat on such land, as it got ahead of the soursops. Members were agreed that it was practically impossible to eradicate soursops, though good crops were grown on land infested by this weed. Some members thought that the land was actually benefited by the weed, and stress was laid on the necessity for getting the seed in in favourable weather, so that the wheat got a good start. Land infested by this weed should not be cropped too often. Pigs, fowls, and pigeons are all fond of the bulbs, and appear to do well on them.

INSECT PESTS.—A specimen of mole cricket was tabled for identification. It was stated that these insects destroyed a lot of grain every year. [The entomologist at the Museum states that the mole cricket feeds mainly on grubs, worms, and other insects, burrowing in search of its feed, and that it hardly does any damage to living vegetation.—Ed.] In reply to question, a member was advised to spray cabbages attacked by aphids with kerosine emulsion.

Saddleworth, May 19.

PRESENT—Messrs. J. H. Frost (chair), W. H. Bee, A. Klem, F. Plant, and F. Coleman (Hon. Sec.).

FARM WORK.—A paper was read by Mr. Plant, who strongly advised keeping the fallow clean, and he found a hand-hoe very useful and necessary after cultivation in removing stray thistles, etc., that may have escaped the scarifier. The farm should keep the table and larder supplied. Groom the farm horses well; a good grooming was a great help to the horse.

BUNT EXPERIMENT.—The Hon. Secretary placed on the table 40 unbroken balls of bunt. These were lightly crushed to powder by rolling a pencil over them. Four hundred grains of Plover seed wheat were then mixed with the powder till every grain was dark-coloured and the brush end of each grain quite black with smut spores. The smutty wheat was that evening divided into four lots of 100 grains each. One lot was immersed for six minutes in a solution of formalin (Schering's 40 per cent. of strength), 1 lb. to 40 galls. water; a second lot in bluestone solution of strength of 1 lb. to 8 galls. of water, for six minutes; a third lot was placed in warm water, kept at a temperature of from 133 degs. F. to 135 degs. F., for 12 minutes; the last lot of 100 grains were unpickled. The following day these four lots of wheat were sown in separate drills, the grains being placed about 2 inches apart in the drill. The soil was damp enough to cause the grains to swell, and probably to grow.

DOES WHEATGROWING PAY? A REPLY.—The Hon. Secretary read a reply to criticism on his estimate in the *March Journal*, page 445. [This is published in another part of *Journal*.—Ed.]

Golden Grove, April 20.

PRESENT—Messrs. Angove (chair), Maughan, Mullett, Harper, G. and J. McEwin, Hutchins, Ross, N. J. and A. D. N. Robertson (Hon. Sec.).

SOIL ANALYSIS.—Mr. Mullett again read his paper on "Double Silicates," and suggested that it would be a good plan if the Government appointed a man competent to make soil analyses and arranged to make a nominal charge for such work. He thought many farmers would be glad to avail themselves of the chance of knowing what constituents their soils needed, instead of simply groping in the dark, as at present. The question, however, was raised by members: Could any one find out what proportion of the food in the soil would be soluble to the plant, even admitting that one could determine the total quantity of such plant foods in the soil.

Whyte-Yarcowie, May 20.

PRESENT—Messrs. Hack (chair), Pascoe, Dowd, Hunt, Pearce, Mitchell, Mudge, Walsh, Jenkins, Francis, McLeod, Rasmus, Kornetzky, and Boerke (Hon. Sec.), and six visitors.

NEW ZEALAND.—Mr. E. Jenkins read an interesting paper dealing with a recent visit to New Zealand.

PICKLING WHEAT.—Mr. Pascoe called attention to results of experiments with formalin, reported on by Mr. H. Roediger, of Gawler River. From this he gathered that the formalin reduced the germinating power of the wheat. He thought the experiment required to be carried further to ascertain how many plants in each plot were free from smut, as it was possible that the fewer plants would yield more sound grain than those treated with other pickles. Mr. Pearce said he had used formalin this year, and found the wheat had germinated well, and the plants were now very healthy.

Sutherlands, May 17.

PRESENT—Messrs. Twartz (chair), Heinrich, Hamerster, Kernich, Stange, C. A. and A. Schiller, and Dart (Hon. Sec.) and two visitors.

WATER CONSERVATION AND IRRIGATION.—Mr. H. J. Dart read an interesting paper on this subject, outlining some of the most important work carried out in different parts of the world. He also described the benefits derived in some of the drier districts of South Australia, from the Beetaloo and Bundaleer reservoirs. The Murray Flats, however, which constituted one of the driest portions of the settled areas of South Australia, possess no scheme for a permanent water supply. Several schemes have been suggested, but none even started, apparently because the residents do not see any immediate return for their money. Any reliable supply of water for these districts must come from the hills to the west, and a scheme has been proposed to conserve water near Robertstown, to supply Eudunda, Sutherlands, Point Pass, and the surrounding districts. He was convinced that a large scheme like this would be better and more economical in the long run than a small one. It was, of course, largely a question of cost. If this large scheme could not be undertaken, work on a smaller scale could be carried out in several localities, and he was satisfied, if once they fully realised what it meant to have a reliable water supply, one or other of these proposals would be accomplished. Much discussion ensued, difference of opinions existing as to how a supply of water was to be secured. Some favoured a large scheme, others boring for artesian supplies, and others again thought the water could be obtained from the Murray if the river was locked.

MAJESTIC WHEAT.—The Chairman tabled splendid sample of this wheat, weighing 67 lb. to the bushel, and spoke very highly of it for hay.

Port Broughton, May 16.

PRESENT—Messrs. Whittaker (chair), Pattingale, Gray, Barclay, Hoar, Button, and Dalby (Hon. Sec.).

PICKLING WHEAT.—Discussion on this subject took place. Members generally were disappointed with the results obtained from pickling in formalin solution, and do not intend to make further use of this fungicide until more is known of its action on the grain, as in the opinion of members too great a proportion of the grain is destroyed. One member stated that he had to re-sow 150 acres, although he strictly adhered to the instructions issued by the Department of Agriculture. None of the members reported any ill-effects from the use of bluestone.

Bowhill, May 13.

PRESENT—Messrs. E. P. Weyland (chair), J. Waters, Drogemuller, Burton, Fischer, Whitfield, A. Weyland, and J. Waters, jun. (Hon. Sec.), and one visitor.

QUESTIONS.—In reply to inquiry as to cause of a horse dripping at the mouth after feeding, attention to the teeth was advised. Seven pounds per acre of lucerne seed was recommended as sufficient to sow.

FARM WORKSHOP.—Mr. Burton read a paper on this subject. A good comfortable workshop, well-stocked with all the necessary tools for carpenter's shop and the repair of all sorts of farm machinery, is a piece of economy which no farmer can afford to be without, and yet it is something which few farmers think they can afford to have. The farmer who has such a shop knows what it is to be constantly beset with borrowers, who think it cheaper to borrow the tools, which they almost constantly need, than to own them themselves. Success in any business depends upon economy of time, and the farmer who loses all the rainy days and the spare hours when work is a little slack, loses quite one-third of his time. It may be urged that farmers need to rest on these rainy days; but change of occupation is rest, and as there is never a time on the farm when there is not work to do, the farmer should lay up work for rainy days, and this can be done if he has a workshop and plenty of tools. He believed that in one year, or, at least, two, any farmer could save enough by doing much of his own repair work, and the many other odd jobs which will suggest themselves to the man with the workshop, to pay for the building of a shop and all necessary tools. Every farmer knows that there is plenty of repair work and odd jobs to be done on the average farm, and if the farmer has not the conveniences for doing this work he must pay to have it done, or leave it undone. The workshop should be large enough to contain a workbench, a blacksmith's outfit, and there should be tools kept for repairing harness and boots. In such a workshop a good many things could be fixed up, which otherwise would be left undone or put aside.

Wepowie, May 16.

PRESENT—Messrs. Orrock (chair), Gale, Crocker, McNamara, and Halliday (Hon. Sec.), and five visitors.

SEED WHEAT.—Mr. J. Hehir read a short paper on the preparation of seed wheat. The portion of the crop from which the seed is to be obtained should be left until quite ripe, and the grain stripped separately from the rest of the field. Run the grain at once carefully through the winnower: to winnow it a second time in the field is a mistake, as the time then is too valuable to give the attention to the work that seed wheat requires. Before seedtime put the grain through the winnower carefully. Raise the sieves higher at the back, as they could then blow harder without losing so much grain as would otherwise be the case. Large plump grain is best for seed, as it gives a stronger plant at the start than small or shrivelled seed. After cleaning the seed on to a sheet or concrete floor, it should be pickled by sprinkling with a bluestone solution. For 10 bags of seed dissolve 5 lb. of bluestone in 15 galls. water. Leave the grain to dry before bagging it; in about a week it will be dry enough to run freely through the drill. Members generally agreed with the paper.

Yorketown, May 13.

PRESENT—Messrs. Correll (chair), Koth, Bull, Sabine, Jung, Domaschenz, and Newbold (Hon. Sec.).

EFFECT OF MANURE ON THE SEED.—The Chairman initiated a discussion on this subject, and expressed the opinion that some fertilisers injuriously affected the germination of the grain. He found on digging up a number of grains in the drill rows that the grains were mouldy and the germ apparently destroyed. He thought this due to an excess of acid in the manure. Other members had noticed no ill-effects on the grain from contact with the manure, but would like to know whether such was likely to occur.

Port Pirie, May 13.

PRESENT—Messrs. Smith (chair), Johns, Bell, Stanley, Hawkins, Spain, Munday, Humphries, Wright, Morris, Teague, Hector, and Wilson (Hon. Sec.).

DOES WHEATGROWING PAY?—Some discussion on this subject took place, and it was agreed that members should consider the question and come prepared to discuss it at the following meeting.

DAIRYING.—Considerable discussion took place on paper read at previous meeting by Mr. A. Bell. The Hon. Secretary said he only kept a few cows, but they paid him. Last season he had on the average seven cows in milk, and they brought in £47, besides which the house was supplied. The previous year five cows averaged £10 worth of butter. With better cows he could considerably improve on these returns. He got about 8 lb. of butter per cow per week for two or three months, but the yield was less for the rest of the year. His cattle lived on natural herbage, in bush country, and, though they did not look very grand, they were free from disease. There was not a great deal of labour attached to a few cows, and he thought, even allowing a fair thing for this and for the use of his land, his cows paid. Mr. Hawkins said some years back they lost 36 cows in three years, and only kept two or three now for supplying the house. He had found dairying did not pay except in good seasons. Mr. Johns reported having cured two cows which he believed to be badly affected by dry bible by giving them plenty of new milk. One of them was lying about for nearly three weeks before it recovered. Several members thought that dairying would pay on a small scale in this district, if much hired labour was not required; while others agreed with Mr. Bell that it was not profitable, the main reason being the losses from disease known as impaction or dry bible. Some of the members agreed with Mr. Bell that poverty of feed and the rearing of calves on skim milk were the main causes of this trouble; but others disagreed with this idea. Mr. Hector said he had found dairying with hired labour not a success. With a good strain of cows and fairly cheap labour he made it pay when the grass was good and butter fetched 1s. per lb., but when the drought came he had to give it up. Where all the work could be done by the family dairying would pay well under suitable conditions, but he was afraid this district was not suitable. Even in the valley of the Broughton they experienced losses in a dry year.

SHORT WEIGHTS IN MANURE.—Mr. W. Smith asked members if they had weighed their consignments of superphosphate. In a two-ton lot of imported manure he found he was 220 lb. short on the gross weight. Five bags of another brand were 7 lb. to 8 lb. short. He thought this a very important matter, and the Branches should bring the matter under the notice of the Government. Mr. Bell had three different lots of manure. On one from the same firm as Mr. Smith's consignment the shortage was 214 lb., while another brand averaged 4 lb. to 5 lb. short. He did not think the importers to blame, or that the shortage was intentional on the part of the manufacturers; still, it should not occur, and farmers should bestir themselves to prevent this. Mr. Munday said buyers had the matter in their own hands. He found one consignment of 8 tons, 7 cwt. short, and since then had always refused to sign any sale note agreeing to accept English weights. Mr. Johns was 50 lb. short on a two-ton lot, but another consignment was better, some weighing 226 lb. gross per bag. One member stated that his consignment, which was from a bulk shipment, was full weight.

Port Elliot, May 20.

PRESENT—Messrs. W. E. Hargreaves (chair), Green, Brown, Pannel, Welch, Stock, and W. W. Hargreaves (Hon. Sec.).

Pigs.—The Chairman read a short paper by Mr. H. H. Hurrell on "Pig-farming." The writer thought farmers should give more attention to this industry. He knew of no better use to which 10. acres could be put if worked as follows:—Sow 10 acres to field peas, at rate of $1\frac{1}{2}$ bushels per acre, manuring with $1\frac{1}{2}$ to 2 cwt. per acre guano. Put in crop about middle of June, as on well-prepared land sown then peas will rarely fail to return 25 to 35 bushels per acre. When ripe, rake the peas into rows, cart, and stack them. What are left on the field the pigs will pick up. Pigs two to three months old will do well and fatten on pea stubble, and beyond being watered twice a day require little attention. Three barb wires, the first within 4 in. of the ground, and the others 4 in. apart, will keep the pigs in the paddocks. In four months from 60 to 80 pigs could be kept well on the pea stubble; then the peas in the stack could be used to top them up. At present low prices such pigs would realise 27s. to 35s. each, returning a very handsome profit, besides which the land would be enriched for other crops. For all-round purposes, the Berkshire, pure, or crossed with Poland-China, while York or Essex was best. If breeding sows are kept pie melons will be found a cheap source of food. They would, of course, require some additional food, especially when rearing their young, but 2 to 3 acres sown to pie melons should produce nearly all the feed required for six breeding sows. Members thought that the pea stubble on 10 acres would not keep 60 to 80 pigs growing for four months.

Kanmantoo, May 19.

PRESENT—Messrs. Lehmann (chair), Mills, Thiele, Hair, R. and J. Downington (Hon. Sec.).

THE MOST PROFITABLE ANIMAL ON THE FARM.—This subject was discussed, and it was unanimously agreed that the sheep took first place for profit. To the general sheepowner members thought still greater profits might be secured by subdividing the best paddocks and sowing such fodder crops as proved suited to the land. This would increase the food supply, and at the same time afford opportunity to give the sheep frequent change to clean fresh food. Mr. Mills stated that he broadcasted one bag of maize on 30 acres of fallow, and after the plant had made good growth he put on 600 Merino wethers, keeping them there for five weeks, during which time they improved considerably. After keeping them off the paddock for a few weeks they were turned on again and remained in the paddock for six weeks, at the end of which period they showed a marked improvement. The brood mare was placed second for profit, and the cow third, the heavy losses from disease being the main factor in placing her so low.

Cradock, April 15.

PRESENT—Messrs. Paterson (chair), Solly, Ruddock, Graham, Marsh, Symons, Glasson, McAuley, Garnet, and Lindo (Hon. Sec.), and six visitors.

WESTERN AUSTRALIA.—Mr. W. H. Haggerty, a former member of the Branch, writing from Western Australia, gave an interesting account of his experiences at Kojanup, where he is now engaged in farming.

REAPING MACHINE COMB.—Mr. Garnet showed model of improved comb, which he had patented. Members were of opinion that this was a very serviceable improvement, and likely to be largely adopted.

COWS EATING POISONED RABBITS.—Mr. Solly showed several carcasses of poisoned rabbits, which he had taken from cows found in the act of eating them. Several cows had been bad as a result of eating phosphorised rabbits, and some had died. He found it a good plan to give limewater to the affected animals. About half a gallon of lime was slaked and added to 100 gallons water, and given freely two or three times a week.

DUNN'S ALGERIAN OATS.—Mr. Solly reported sowing 1 bushel of these oats at Uroonda in 1903, from which he reaped 11 bags. In 1904 the crop was destroyed by rabbits.

Denial Bay, April 19.

PRESENT—Messrs. Smith (chair), Lowe, Starling, Schmidt, Dunnet, Hastings, and Gale (Hon. Sec.).

FALLOWING.—The Hon. Secretary read a paper on this subject, to the following effect:—"Now that there is a considerable acreage of old cultivated land cropped in these districts, their methods of farming would have to undergo a decided change if they wish to reap good average crops. When the land was all new and free from weeds it did not matter very much how they farmed; in fact, in the early days of the coast it was said, 'We only had to tickle our land and it would laugh a payable harvest in a good season,' and this simile had a good deal of truth in it. He had known scrub land on the coast that had never had a plough on yield a very payable return. The seed was sown broadcast and simply scratched in with the harrows. In his opinion there were two reasons why they did not reap a better return off the old cultivated lands. First, lack of moisture, and second, a too abundant growth of grass and weeds. Fallowing would in a great measure overcome both of these. He did not mean simply ploughing the ground anyhow, or at any time of the year. The ground should be ploughed before the grasses and weeds begin to seed, so that every particle of it is turned and ploughed only while wet. The time would vary according to the season, but usually June and July, and in a late season up to the middle of August, are the proper times to fallow. By fallowing the land while wet they conserved a large percentage of the winter's moisture, so that the crops got the benefit of a good percentage of two seasons' rainfall. In the second place, fallowing is the only way in which they could destroy the grass and weeds, as it was very seldom they got the rains early enough to start the weeds before it was time to finish seeding. He knew from experience that there were some parts of their farms that it was not safe to fallow, on account of drifting; at the same time, he did not know of a farm in the district but what had a large area which could be safely fallowed. Where there is a danger of drifting he would plough the land as wet as possible, and let it lay till seed-time. If any rubbish starts to grow allow a few sheep to stray over it occasionally. They could have no better fallow cleaners than hungry young sheep. He hoped and believed the time was not far distant when every farmer here would have a small flock of sheep, which useful animals were so necessary to the prosperity of the farmer. Another advantage of fallowing was that the work for the horses was more evenly divided throughout the year. At present, for about five months of the year they were out of collar, and then when seedtime comes they were nearly worked to death in many instances to get the necessary work done in the season. If every farmer would make a practice of fallowing two-thirds, or at least one-half, of the area he intends to crop, he would find that not only were his returns very much better, but the work would be done with much more comfort to his stock and himself. He firmly believed that if they made a practice of fallowing and using manure judiciously—he said judiciously, because he thought that owing to the limited rainfall they might easily over-manure the old scrub land—that their returns at harvest time would not be far from double what they have been in the past. He found that on the old scrub lands 40 to 56 lb. of super per acre was ample."

RABBIT DESTRUCTION.—The Hon. Secretary read an extract describing the method recommended by Mr. W. Rodier, of Tambur Station, New South Wales, for overcoming the rabbit difficulty. His scheme was to trap as many rabbits as possible, destroying the does, but releasing the bucks. By this means there would soon be a considerable excess of bucks, and when this occurs the males will kill the young rabbits as soon as they are born. They will also persecute the does, with the result that they will not breed to any great extent. In this way the natural increase is prevented, and as the males die off of old age or are destroyed by their enemies the practical extermination of the rabbits is brought about. He was aware that the scheme would be ridiculed by 95 per cent. of landowners, but he had followed it for over 16 years, and it had stood the test of time on 64,000 acres at Tambur, situated in the very heart of the rabbit areas. They might ride all day over this run and not see more than three or four rabbits, but immediately outside his netting boundary the rabbits were very numerous. He was perfectly certain that ordinary methods of poisoning and trapping simply meant the perpetuation of the rabbit pest, whereas if his scheme was adopted it would be equally effective in other localities, as it had been on his run.

Mount Gambier, May 13.

PRESENT—Messrs. Edwards (chair), Pick, Sassanowsky, Smith, Holloway, Vorwerk, Norman, Ruwoldt, Wilson, Williams, and Collins (Hon. Sec.).

SHEEP COMPLAINTS.—Further discussion on footrot in sheep took place. Members thought that the footrot prevalent at one time in the South-East was not the contagious footrot described in English reports. Mr. Pick said that he had had a long experience of the trouble in the South-East, and always found that dressing the feet and then running the sheep through an arsenical preparation effected a complete cure. He had often seen 60 per cent. of the lambs unable to stand owing to footrot. Mr. Holloway said it seemed peculiar that in the South-East Lincoln and other longwool sheep did not suffer, the Merino being the only breed affected. Mr. Sassanowsky referred to affection of the mouth in young lambs. They used eucalyptus and salad oil as a dressing, and found it effective. It took about three weeks to cure the trouble. Mr. Collins said he noticed that many of the fat lambs in the Adelaide market were similarly affected. In New Zealand it was found that the trouble was due to a parasite, and each lamb was treated separately with a mixture of Little's dip. Mr. Williams had seen a lot of this trouble in lambs at Wolseley and elsewhere, and had no doubt it was caused by a parasite. Carbolic acid and glycerine was very useful.

AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.—Mr. James Pick read the following reply to Professor Perkins's report on the above subject:—"When I undertook to write a short paper dealing with Professor Perkins's pamphlet on the South-Eastern lands, I had no idea of what a task I had undertaken. Since then I have been studying the work, until I have got quite muddled over nitrogen, phosphoric acid, potassium oxide, calcium oxide, etc. I find that I must confine myself to generalities, and to what I consider the over-estimation in which the South-East is held by the professor and others. The area under notice contains 3,744,640 acres, and according to the professor the area under cultivation is 59,772 acres, and he states that the gross returns of this area are £4 4s. 10d. per acre yearly average, over a period of seven years, and that if half the gross area was under cultivation, although some of the land is of lesser fertility, that immense area of 1,872,320 acres would give a return of £3 per acre. The professor says that he can prove this by figures. I would like to know how many farmers can say that they have received anything like such returns. We must remember that the choicest spots in the South-East are already well under cultivation, viz., Mount Gambier, Glencoe, and Millicent. These spots are mostly in evidence, but they are not the slightest guide to the value of the million and three-quarter acres referred to by the professor. In my opinion, the South-East is about the poorest district, as far as fertility of the soil is concerned, of any part of South Australia in the farming areas. Its rainfall is its only advantage. We are all aware that it would be an immense advantage to the South-East and to the State if the large estates were broken up into fair-sized farms. But it would not make the difference stated by Professor Perkins. He speaks of increasing the productiveness of the land 20 or 30 fold, and, on page 7, speaking of a better system of farming, says that where one sheep now finds a scanty living 10 would pasture at ease. The professor advises mixed farming, as if it were something new, but, as a matter of fact, nearly every farmer in the South-East who has land enough practises it already. He also strongly advocates the growing of fodder crops and hand feeding, and falls into the same error as most theorists: that the system pursued in the home countries should have the same profitable results here. He overlooks the fact that when a farmer in England, and other countries, by dint of growing various crops and feeding them to sheep or cattle, has succeeded in fattening them, a sheep is worth about £3 3s., and a bullock about £25, whilst in the South-East (when the North is in fair condition), a sheep is worth from 8s. to 12s., and a bullock about £6 or less. The professor says that the statement that the labour that is required for what is called hand feeding will swallow up the profits seem to him almost childish in its simplicity. If he had to farm in the South-East on his own account he would not find it so childish as he thinks. With respect to intense culture, as it is called, we must remember that there are only a few items of production that can be depended upon to find a certain market. They are wheat, wool, butter, and fat stock; even the latter item is very uncertain. The other productions of a farm, namely, potatoes, onions, cheese, oats, barley, etc., depend upon local markets, and

are very subject to over production, as, for instance, last year, when potatoes and onions were almost unsaleable, oats 1s. a bushel, barley 1s. 3d. Now, if the whole of the 1,872,320 acres were in the hands of farmers, as the professor suggests, about the only things they could find a sure market for would be wheat, wool, and fat stock, and I would like the professor to show us how they could secure a gross return of £3 per acre. The professor is quite right in saying that the fat lamb industry would not be ruined by the subdivision of the large estates. The bulk of this land is not good enough for small farms, but must be put into farms of from 500 to 1,000 acres, and there would be quite as much stock kept on the farms in addition to wheatgrowing as there is at the present time. With respect to the professor's remarks as to the farmer of the future turning sheepbreeder, I can assure him that there are many farmers in the South-East now who breed as good stock for fat lamb purposes as any of the largest flockowners. I am fully prepared to allow the professor credit for the best intentions in his description of the possibilities of the South-East, but there is no good purpose to be served by exaggeration. The greater part of the South-East is miserably poor soil, and although it may be greatly improved by cultivation, there is certainly no warranty for the professor's question, on page 30, of 'What is to hinder the South-East from exporting, proportionately, as much frozen meat and dairy produce as New Zealand?' That country is without doubt one of the most fertile countries in the world; whereas, with the exception of a few small districts, the South-East is poor farming country. I hope that in buying land in the South-East the Government will not be influenced by the returns from Mr. Ruwoldt's farm, as I don't think another farmer in the South-East could furnish such a record. In conclusion, I would remark that if any practical utility is to be the outcome of all analyses of soils, and the discovery of what they are deficient in, and what requires to be added to make soils fruitful, there never was a better opportunity of proving it than the present, by giving attention to the Pinnaroo lands. The settlement of these lands will cost the country hundreds of thousands of pounds; and the success or probable ruin of scores of industrious families will depend on the success or otherwise of farming in that district. I therefore think that it is the duty of the Minister of Agriculture to see that Professor Perkins and other officers, whose duty lies in that direction, should use their best energies and give all their time, if necessary, to assist the Pinnaroo settlers to treat their soil in such a way as to induce success. If the professor will do this, he will deserve the best thanks of the country, and he could not probably have a better opportunity of proving the value of scientific farming."

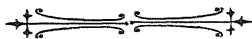
Petina Well, April 22.

PRESENT.—Messrs. W. Penna (chair), A. and R. Penna, Norton, Giles, Johnstone, Boyton, and Fiddaman (Hon. Secretary).

GRAIN MALTING.—Some discussion on this subject took place, Mr. Giles stating the oats did not malt in the ground, but this view was opposed by other members. In reply to question, Mr. R. Penna said he thought plump grain would malt quicker than a shrivelled grain. Grains of wheat which had put out roots without any indications of any stem were tabled.

INCUBATORS.—Mr. W. Boyton read a paper on this subject, dealing with the construction and management of incubators with the hot water tank. The tank, which is the principal part of this machine, is made either from copper or galvanized iron. Copper is preferable, because the tanks made of galvanized iron generally rust after one or two seasons' use. The tank is situated about the centre of the incubator and immediately above the drawer. Above and around it are packed sawdust and charcoal, or asbestos, to keep warmth in and cold out. A portion of the space above the tank is occupied by a little compartment known as the drying room. Below the tank is the drawer, in which the eggs to be hatched are placed. The bottom of the drawer is made of perforated zinc. Underneath this and on the bottom of the machine is a shallow tray to hold water and occupying the whole area of the bottom of the machine. On the side of the incubator is a frame holding the lamp. Pipes from this frame pass through the tank, heating the water. Immediately below the tank, and above the eggs in the drawer, is a frame holding the capsule, filled with ether. From this capsule a rod passes

through the tank to a lever rod on top of the machine. This rod works a damper on the lamp frame, and so regulates the temperature. When starting the incubator, fill the tank, and then see that the lamp is filled and wick trimmed. It is advisable to use only the best kerosine, as the inferior oil nearly always smokes and causes a soot to form in the pipes, which are rather difficult to clean out. When the water is heated to the right temperature let the machine run for a time to see that there is no hitch in the workings. If the trial is satisfactory the eggs can then be put in the drawer. If the temperature in the drawer rises over 104 deg. F.—[Should be regulated not to exceed 103 deg. F.—Ed.]—the ether in the capsule expands and raises the perpendicular rod resting upon it. This lifts the lever on top and raises the damper, thus allowing the heat to escape from the lamp box, so lowering temperature of water. To make certain that the ether capsule is doing its work the temperature of air in the drawer should be taken at frequent intervals by a small thermometer inserted through the front of the drawer. [The thermometer should be kept in the drawer, and it is important that its accuracy should be ascertained, as the variation of one or two degrees may ruin the eggs.—Ed.] The eggs should be turned once in every twenty-four hours. The reason for having a tray of water under the eggs is so that the air in the drawer will be kept moist. Otherwise the egg shell would become so hard that the chicken would not be able to pick its way out. On the seventh day after putting the eggs in they may be tested to find out which are fertile and which are unfertile. The testing apparatus is very simple. It can be made out of light cardboard or thick brown paper. It is a cylinder with a slit about the size and shape of an egg on one side. It is put over a lamp so that the flame is level with the slit in the paper. The egg is held up close to the hole, and the light of the lamp being concentrated on the one spot makes the egg transparent. In the healthy, fertile egg may be seen a dark spot in the centre of the yolk, with veins, etc., running off in different directions. This somewhat resembles and is sometimes spoken of as the spider. In the unfertile egg the dark spot is missing, and it looks very little different from a new-laid egg when looked at in the same way. Any unfertile eggs should be removed from the drawer. It is hardly necessary to mention that hens' eggs take 21 days to hatch and ducks' eggs 28 days. The one great thing in working an incubator is regularity in attendance. It is advisable when turning eggs to leave the drawer open for a little while and so give the eggs an airing. [From 5 min. to 20 min., according to weather and period of incubation. In cold weather, leave open for a short period only.—Ed.] These machines are readily understood, easily worked, and when in good order are very successful.



DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	June 14	July 12	Minlaton ..	June 10	July 8
Bagster ...	17	15	Morchard ..	—	10
Balaklava ..	10	8	Morgan ..	10	15
Booleroo Centre ..	13	11	Mount Bryan East ..	17	—
Bowhill ..	3	1	Mount Remarkable ..	15	—
Brinkworth ..	2	7	Nantawarra ..	14	12
Burra ..	16	21	Naracoorte ..	10	8
Carrieton ..	30	—	Norton's Summit ..	16	14
Cherry Gardens ..	13	11	Onetree Hill ..	15	13
Clare ..	16	14	Orroroo ..	9	14
Colton ..	3	1	Penola ..	10	8
Crystal Brook ..	10	—	Penong ..	10	8
Eudunda ..	19	17	Petina ..	17	8
Finniss ..	5	3	Pine Forest ..	13	11
Forest Range ..	15	13	Port Broughton ..	17	15
Forster ..	17	15	Port Elliot ..	17	15
Gawler River ..	16	14	Port Lincoln ..	17	22
Golden Grove ..	15	13	Port Pirie ..	10	15
Gumeracha ..	12	17	Redhill ..	13	11
Hartley ..	—	14	Richman's Creek ...	19	17
Inkerman ..	13	11	Riverton ..	17	15
Johnsburg ..	17	—	Saddleworth ..	16	21
Kanmantoo ..	16	14	Stockport ..	12	17
Kingscote ..	12	10	Strathalbyn ..	19	17
Kingston ..	24	29	Sutherlands ..	14	—
Koolunga ..	15	13	Utera Plains ..	17	15
Koppio ..	15	—	Virginia ..	12	17
Longwood ..	14	12	Wandearah ..	12	17
Lyndoch ..	15	13	Wepowie ..	13	—
Maitland ..	3	1	Whyte-Yarcowie ..	17	15
Mallala ..	5	3	Willunga ..	3	1
Mannum ..	16	14	Wilmington ..	14	12
Meadows ..	2	—	Wilson ..	17	—
Meningie ..	10	8	Woodside ..	12	—
Millicent ..	1	6	Woolundunga ..	3	8



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

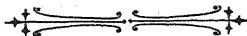
Labor Bureau.

*Number of persons registered and found employment by Government Departments
and Private Employers from April 26 to May 29, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	42	74	115
Masons and bricklayers	1	—	4
Carpenters	1	—	3
Painters	1	3	11
Blacksmiths and strikers	6	—	—
Fitters and turners... ..	2	—	1
Patternmaker	—	1	—
Well borer	1	—	—
Cook	—	—	2
Apprentices	13	5	—
Cleaners	10	8	4
Porters and junior porters	9	8	4
Rivet boy	1	—	—
Totals	87	99	144

May 31, 1905

A. RICHARDSON, Bureau Clerk.

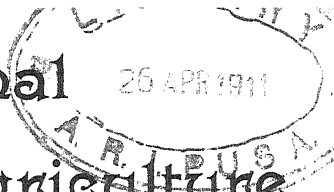


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R. W. FOSTER,

Minister of Agriculture.

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GENERAL NOTES.

New Offices, Department of Agriculture.

By the time this issue is published, it is anticipated that the Department of Agriculture will be located in the Treasury Buildings, opposite the General Post-office, the rooms occupied by the Stock Department and the Roads Department having been renovated and fitted up for occupation by the Agricultural Department. These offices will be considerably more central and convenient to the public than those on North Terrace. Visitors should note that the entrance to the offices will be from Flinders Street.

Agricultural Bureau Congress.

The Seventeenth Annual Congress of the Agricultural Bureau will be held in Adelaide during September Show week. As in former years, two railway tickets will be available for each Branch. It is particularly requested that papers for Congress should be submitted as early as possible, and also suggestions for subjects for discussion, in order that a selection may be made before the third week in August. Unless this is done, it is impossible to advise delegates of the programme of the Congress before they leave their homes.

Agricultural Bureau Reports.

Owing to an extraordinary pressure of work during the past few weeks it has been quite impossible to prepare for publication the reports of all meetings of the Agricultural Bureau received during the month of June. A number of these reports have, therefore, been held over until August issue. We regret the necessity for this, and trust that the members of the Bureau will recognise our difficulties in dealing with the large number of reports which continue to come to hand.

Reports of Lectures by Officers of Department of Agriculture.

Recently several Honorary Secretaries of Branches of the Agricultural Bureau have been to very considerable trouble to furnish for publication in *The Journal of Agriculture* lengthy reports of lectures delivered by officers of the staff of the Department. The Editor desires to express his appreciation of the action of the Hon. Secretaries in this matter, but would like to intimate that it is not expected that they should undertake this work. It is altogether too much to expect any one but a competent shorthand writer to attempt to take a full note of addresses by

officers. Besides this, it is expected that the officers themselves will supply from time to time for publication in *The Journal* articles on similar subjects to those upon which they lecture. In forwarding reports of meetings which are addressed by officers of the Department it is sufficient for the Hon. Secretary to report on the attendance, general business, and resolutions carried, although when any special points are elicited in reply to questions it may be as well to make a note of them.

Roseworthy College Scholarships.

Six scholarships of the annual value of £30, and tenable for three years at the Roseworthy Agricultural College, are offered for competition. Competitors must be not less than 16 nor more than 19 years of age. To offer country boys a better opportunity, the State is divided into six districts, and one scholarship is offered in each. Full particulars concerning conditions and scope of the competition may be obtained on application to the Secretary of the College. As the range of subjects upon which candidates are examined has been much simplified, it is hoped that next year there will be more competition than in the past from boys in the farming areas. Although the examinations do not take place until about the middle of March of next year, intending candidates should be qualifying themselves now, especially in those subjects in which they may perhaps be weak.

Poultry Expert.

Members of the Agricultural Bureau and readers generally will be pleased to know that the Government have appointed Mr. D. F. Laurie Poultry Expert and Lecturer, and have placed him on the staff of the Agricultural Department. Mr. Laurie has acted in an honorary capacity as adviser to the Department on poultry matters for a number of years, but his services have only been available on rare occasions for lectures in country districts. Now, however, a large portion of his time will be devoted to this work, and Branches of the Agricultural Bureau desirous of arranging for lectures and visits to poultry farms by Mr. Laurie should make application to the Secretary for Agriculture.

Cattle Complaint—Dry Bible.

For some time Veterinary Surgeon Desmond has been making preparation for proposed investigation into the cause of the disease variously known as "impaction," "dry bible," "paralysis," etc. Some comment has been made on the apparent inactivity of the Department in this matter, but many are not aware that such an investigation requires very careful preparation, and cannot be entered upon without such; besides which, the Veterinary Surgeon has had many important calls upon

his time. The Hon. Minister has now given instructions that the greater portion of Mr. Desmond's time for the next few months shall be devoted to this enquiry, and stockbreeders may rest assured that no stone will be left unturned by the Veterinary Surgeon and by the Department to get at the cause of the heavy mortality amongst their herds. Branches of the Agricultural Bureau will please note that no further appointments for lectures by the Veterinary Surgeon can be made for two or three months.

Prizes for Export Butter.

The Committee of the Royal Agricultural Society has adopted the recommendation of the Dairy Expert, to have all exhibits of export butter placed in cold storage for six or eight weeks prior to the show. Such exhibits will be judged and points awarded on arrival, and again at different dates during storage, and finally the day prior to the show. This system is essential if we are to arrive at the value of the exhibits for export purposes. Particulars as to points awarded for flavour, texture, colour, salting, and finish will be given. It would be advisable to have particulars from the exhibitors as to breed of cattle, pasture fed on, date and method of manufacture, etc. Such a test would prove of a high educational value to the manufacturers, and the results of the judging could be printed and distributed in pamphlet form. The previous system of judging export butters was by no means calculated to bring about the improvement which is so necessary, for the butter was freshly made, and there was no test of its keeping quality, which is essential for best returns. Freshly-made butter, possessing poor keeping quality, may secure first prize, yet after a month or two months' storage would not be within pounds' value per ton of a second-prize butter possessing good keeping qualities. A very good plan adopted by the Agricultural Departments of other States is to keep a record of the points awarded for the butter shipped throughout the whole export season and to award a prize to the factory securing the best figures. In New Zealand the Agricultural Society at Otago has offered prizes of £25, £10, and £5, for both butter and cheese, and this is to extend over four years, half the amount being subscribed by the Shaw-Savill and Albion Shipping Company and New Zealand Shipping Company.

Comforts of Dairy Stock.

The general comforts of all dairy stock should be most carefully looked to now the cold weather is to hand, for in order to secure good results it is absolutely essential that the cows should be made comfortable. Next to a shortage in the food supply comes uncomfortable surroundings in causing a rapid decrease of the milk supply. After providing the cows with plenty of good milk-making food, attention should be given to good shelter, in the shape of warm paddocks, with good hedges and trees, open shelter sheds, or rugs.

Dairy Factory' Co-operation in Victoria.

At a recent meeting of the Western District Factories Co-operative Produce Company, Limited, held in Warrnambool, the transactions for the first six months' operations showed that the object of the Company had been realised, viz., to secure better returns for the producer. This Company was formed by ten Co-operative Butter and Cheese Companies in that district and three Gippsland factories, the object being to do away with agents, and to control their own business on purely co-operative lines, and their efforts have been highly satisfactory. The turnover for the six months under review showed that the Company had handled £255,029 worth of goods, that the commission and profits made on factory requisites were £4,337 7s. 11d., and after the whole of the expenses had been paid there was a net profit of £1,508 available for distribution amongst the thirteen co-operative factories. The expenses included all preliminary expenses. The Directors propose to return as a bonus £1,095 19s. 11d., of which one of the factories receives £399 19s. 7d. Allowing that the salaries paid by the thirteen co-operative factories to their managers equalled over £4 per week, it will be seen that the total cost of management for the six months is more than paid from the profits of the six months' operations just closed.

Export of Butter from Argentina.

The following figures will show the beginning and progress of the butter exports from the Argentina to Great Britain:—

Year.	Tons.	Year.	Tons.	Year.	Tons.
1895 ...	7	1898 ...	867	1901 ...	1,352
1896 ...	689	1899 ...	950	1902 ...	2,529
1897 ...	541	1900 ...	1,361	1903 ...	4,500

Previous to 1896 the old station method was adopted, viz., shutting the calves up at night and milking the cows only in the mornings, as was done on most stations in Australia, but with improved methods the development of the industry has been very rapid.

Exports and Imports of Fruits.

During the month of June the Inspectors under the Vine, Fruit, and Vegetable Protection Act in Adelaide have admitted 9,967 bushels of fruit and 98 parcels of plants. Within the same period 5,298 bushels of fruit, 137 parcels of plants, and 2,948 parcels of vegetables. Of the imported fruits, 9,566 bushels were bananas. Of this kind of fruit 262 bushels were refused, owing to being overripe. The exported fruits consisted of 4,334 bushels of locally grown produce, the remainder being made up of imported fruits which were re-exported. Broken Hill took 5,258 bushels of fruits and 2,948 (or the whole) of the parcels of vegetables.

CHARLES J. VALENTINE.

Under the provisions of the Septuagenarians Retiring Act, Mr. C. J. Valentine, Chief Inspector of Stock and Registrar of Brands, having reached the age of seventy years, retires from the service of the Government of South Australia.



CHARLES J. VALENTINE.

Mr. Valentine was born in England, and emigrated to Victoria in 1852, and in the following year removed to the South-Eastern district of South Australia, where he engaged in pastoral pursuits. With the exception of a few months spent in Victoria, Mr. Valentine remained in the South-East until 1865, when he was appointed Chief Inspector of Sheep, in succession to Mr. H. T. Morris. The same year, in conjunction

with the Hon. C. Bonney and Mr. Wentworth Cavenagh, M.P., he was appointed by the Government to enquire into the losses occasioned by the great drought of 1864-5, and to suggest palliative measures.

Mr. Valentine represented South Australia at the first Australian Stock Conference, which was held in Sydney in 1874, and has been one of our representatives at successive conferences held since that date. When the Brands Act of 1879 came into operation Mr. Valentine was appointed Registrar of Brands. In 1885 he took a holiday trip to England, during which time, at the request of the Government, he enquired into various diseases of stock, and on his return submitted a valuable and interesting report on his enquiries.

In 1888 a Bill to amend and consolidate the various Stock Acts was prepared by Mr. Valentine, and on the passing of the measure he was appointed Chief Inspector of Stock. In September, 1888, Mr. Valentine was appointed a member of the Central Agricultural Bureau, a position he held until that body ceased to exist, on June 30, 1902.

Mr. Valentine's administration of the department over which he has presided for so many years has been very successful. His firmness, combined with tact, has met with the almost unanimous support and approval of the stockowners and stock agents of the State. No better proof of this is needed than the unanimous support given to the petition asking that Mr. Valentine's services should be retained for another year. To his many friends and fellow-officers it is a matter of deep regret that he has now severed his connection with the Stock Department

WINTER DWINDLING IN BEES.

By S. H. CURNOW.

[The following paper was read at a meeting of the Cherry Gardens Agricultural Bureau. As the matter is seasonable and important, it is published as a separate article.—ED.]

The subject that I have chosen for my paper may prove to be a little devoid of interest to others than bee-keepers; but, as our papers and discussions during the past twelve months have treated mainly on agriculture, horticulture, and dairying, I have sought to give variety to the list.

Winter dwindling in bees is a trouble that all bee-keepers have to contend against. It has several causes, all of which can be overcome by diligent and unwearying attention on the part of the apiarist, especially so if the regulation Langstroth beehive is in use, as this greatly facilitates the thorough overhauling of the colonies, and it is only by a thorough and careful investigation of each individual colony that a correct diagnosis can be arrived at. Foul brood, dysentery, bee moth, starvation, and degenerate stock are the main factors which bring about this annual diminution, and foul brood in a bad year has been known to exterminate a moderate-sized apiary in a few months. It is the aim of all good bee-keepers to maintain their colonies in as strong and vigorous a condition as possible, and it is only by so doing that the best results are obtained.

If disease, or vermin, are present in an apiary they must be eradicated at once, and a vigilant lookout kept to see that their extirpation is complete.

To make this paper as plain as possible, I have dealt with each of the above troubles under a separate heading.

Foul Brood is caused by a species of bacilli which is known to science as *Bacillus alvei*. This trouble must be attended to promptly, as it is of a most serious nature. The early symptoms are readily detected by the experienced bee-keeper. He first notices an irregularity in the hatching of the brood, the cappings are sunken and perforated in the centre, and on its removal the larva is discovered to be dead and lying on one side of the cell in a very shrunken condition. Its colour will be brown, varying from a light brown to a dark coffee colour. I have seen ordinarily chilled brood bearing a similar appearance, but foul brood can invariably be distinguished from the chilled by running a needle through the larva. If on withdrawal a ropy matter, not unlike spittle, adheres to the point of the needle, and stretches out to about an inch in length before breaking, it is a sure sign that the brood is foul, as this ropiness is not a characteristic of chilled brood. Another sure symptom is the disagreeable odour emitted from the hive when foul brood is present. This odour has been likened to that which arises from common glue when in a melted condition. As soon as the apiarist has convinced himself that foul brood exists in his apiary he must act promptly. The cure is simple. It consists solely of transferring the bees from the infected hive to another that has been specially prepared for the occasion. This new hive contains nothing but frames fitted with full sheets of foundation comb, all honey being strictly prohibited. The bacilli germs can only exist in honey, therefore as the bees are compelled to convert all the honey they may have in their sacks into wax, the germs are thereby destroyed by this digestive operation. It is necessary that the bees be strictly confined for at least forty-eight hours, after which time a little pure honey or boiled sugar may be fed to them daily, until they can get to work again. This is a sure and simple cure, and is much preferable to the chemical treatment. Foul brood is an epidemic, and it is some years since we had our last serious attack; but, at the same time, it is necessary to burn all old combs, mats, frames, etc., that are taken from an infected hive, and the hive itself should be thoroughly disinfected, for fear of another outbreak.

Bee Moth.—This pest is well known to all those who have kept bees, as it is now distributed throughout the Commonwealth. There are two species of the moth, but the one that is most generally dealt with is a small, insignificant, little insect, as compared to the larger variety. The moth itself is harmless, the larva only being the destructive agent. The bee moth is widely distributed in Europe, Asia, and America, in all of which countries, as well as here in Australia, it is a source of trouble to apiarists.

In warm climates, such as this, as many as three, and sometimes four, broods are hatched in a season, so that beekeepers must be ever vigilant. There is no artificial remedy, nor is one needed, so long as the colonies are kept in a strong and vigorous condition. Purebred Italians or Ligurians are seldom troubled with the moth, as they eject the larva as soon as it makes its appearance in the comb; but the black or German bee is not always so diligent, and unless the colony is particularly strong will allow the moth to thrive and multiply, seeming to ignore the presence of so deadly an enemy. It is the small and weak colonies that suffer mostly from the effects of the moth, and if the pest takes a firm hold of the hive before the cold, winter months set in, the chances are two to one that the colony will be extinct before the advent of spring. The moths, when holding undisputed sway, multiply rapidly, and will quickly devour the contents of a deserted hive. I have seen masses of fibre, cocoons, moths, and larva, as large as a man's head, removed from an old hive the few bees of which had been exterminated by the pest. The larva of the moth feeds only on wax, and it is owing to this exclusiveness in its diet that in some districts, where Italians are the only bees kept, it has become practically extinct. When the moth has been discovered in a hive, the bee-keeper should carefully inspect each individual comb, and with the point of a needle or hairpin extract the larva, which is usually found at the end of its web-bound tunnel or passage-way. These tunnels reticulate throughout the whole comb, so that care is necessary to see that no grubs are overlooked. The apiarist should avoid leaving spare pieces of wax in the hive, and see that the bottom board is clean and free from uncappings and other particles of comb that accumulate thereon, as the larva delights to harbour in such congenial spots. Careful attention must also be given to the hive, all crevices closed up, and the doorway reduced to a minimum. These few directions, if carefully carried out, will greatly assist the bees in ridding themselves of this pest.

Dysentery is a complaint that is not particularly troublesome in South Australia, and although we have kept bees for a great number of years I can only remember one season in which the disease made its appearance. We first noticed the front of the hive becoming very dirty and ill-smelling, and an investigation proved that the filth arose from the excremental discharge of the bees. This unnatural laxativeness is caused by the bees eating unwholesome and unripened honey, and also through the hives being too open and cold during the winter months. Honey gathered from rotten fruit is very liable to cause dysentery, and especially so when it is eaten in the colder months of winter. Honeydew also has been known to cause the complaint. The remedy for this disease is somewhat similar to that recommended for bee moth, in that you must keep the colonies strong and the hives tight and snug during the winter months, warmth being a decided preventive. When the trouble arises from unwholesome diet a course of boiled sugar should be given until the

bees can gather fresh supplies. No medicinal remedies are necessary, as most apiarists consider that with the advent of a few warm days, so that the bees can make a full flight, the trouble will be at an end.

Starvation.—I do not think that I need go into detail on this subject, for it is obvious that if beekeepers continue to extract so late into the season that they rob the bees of their winter supplies, trouble must be expected, and it follows that unless the bees are artificially succoured during the months of inactivity, starvation must sooner or later overtake them, with the inevitable result that they will be exterminated. Bee-keepers should be observant, and when the signs are unfavourable to a late flow should give the bees ample time in which to replenish their stock. Many bees are lost annually through starvation, and all I can say is that it is nought to a man's credit who will jeopardise the lives of his bees through the greed of gain.

Degenerate Stock.—I am convinced that in-and-in breeding is responsible in a very large degree for the many small swarms, even those of the first cast, that are procured in many of our apiaries. It seems only reasonable to expect that where large numbers of bees are congregated in a small space the chance of a young virgin queen mating with a drone of another strain is rather remote, as the thousands of drones hovering about an apiary would hardly allow her to escape to any great distance, and it so follows that unless new blood is introduced artificially the strain will gradually run out, and degenerated stock will result. Degeneration in the vitality of the bee must necessarily mean deterioration in its fertility, and when we consider the amount of work that is expected from a queen bee in keeping the colony in a state of proficiency, it will be readily understood why it is necessary that only the most robust and prolific queens should be kept. A good queen will lay as many as 3,000 eggs in a day, but many do not lay half this number, and it is these latter which we wish to replace by more prolific layers. In introducing a new strain to your apiary it is advisable to import from some distant bee farm so as to make sure of totally new blood. The mode of introduction is simple. First kill one of your weak queens, remove all eggs from the hive, and at the end of twenty-four hours swing your caged queen in between two combs in the midst of the colony. At the end of twenty-four hours she may be liberated, and the bees will take to her. In buying bees buy purebred Italians, as they are the better of the two, and if possible purchase a queen that has been fertilised by an Italian drone, as then all the young queens raised from your purchase will be purebred stock. In re-queening the hives, or colonies, it is only necessary to destroy the old queen, and a couple of days after introduce a comb with a queen cell almost ready to hatch attached to it, and when the young queen emerges from the cell the bees will accept her quite naturally. The best way to procure the aforesaid queen cells is to make a hive queenless, and at the end of two or three days insert a couple of

combs of new eggs, from which the bees will be sure to rear at least half a dozen young queens.

In concluding this paper I should just like to mention one other trouble, and it is this: All first swarms issuing from a colony take with them the old, fertilised queen, and leave in her stead the young queen just about to hatch. When this young queen is a few days old she will leave the hive on her wedding flight. After she has met the drone she will return to the colony, and from that day on she will lay fertilised or worker eggs. Should she fail to meet a drone, however, and have no desire to take another flight, she will commence to lay drone eggs, and, of course, will be useless, as it will be easily seen that the stock would soon die out. Should the virgin queen, however, meet with a mishap and fail to return to her hive, her colony would be queenless, and unless assisted by the apiarist by artificial means would remain so, unless there happened to be a few worker eggs in the combs, in which case, of course, the bees would soon raise a new one. It sometimes happens, however, that a worker bee will commence to lay, but, like an unfertilised queen, she lays only drone eggs, which are useless as far as the increasing of the worker stock is concerned. A laying worker is a great nuisance, besides being useless, as the bees often refuse to accept a good fertilised queen when she is given them, generally stinging her to death as soon as she is introduced into the colony. In a case of this sort it is best to distribute the bees amongst the other colonies and close the hive.

ADVICE TO BEGINNERS IN BEEKEEPING.

From *The Journal of the Board of Agriculture*, England.

The keeping of bees, both for pleasure and profit, is, happily, much more frequent now than thirty years ago, when the advent of cheap sugar had nearly driven from the country markets the coarse honey gathered by the old straw skep system. This increase of bee-keeping has been brought about by the perfecting of the modern frame hive, which enables the home of the bee to be laid open to view, and provides means whereby the stores can be taken, fit for immediate use, without injury to the bees or their owner.

For any one desirous of becoming a bee-keeper, the first step is to get a book on apiculture and study it. There are many now from which to choose, but the following may be recommended: "Modern Bee-keeping" (price, 6d.), published by Longmans, Green, & Co., Paternoster Row, for the British Bee-Keepers' Association; and the "British Bee-Keepers' Guide Book" (price, 1s. 6d.), by Thos. W. Cowan, F.L.S., 10,

Buckingham Street, Strand, London. As a personal explanation of the terms used and of the outfit required is a great help, an interview should, if possible, be obtained with an experienced bee-keeper. In "Modern Bee-Keeping" will be found a list of Secretaries of County Bee-Keepers' Associations, any of whom will be able to furnish names of expert bee-keepers willing to render assistance if needed. The appliances required are:—Black net veil; smoker, for subduing bees; wax comb foundation (brood and super); bottle-feeder; section boxes; frame hive, fitted with brood foundation in ten or twelve standard frames, two division boards, section-rack or lift of shallow frames, a queen excluder, and quilts. If the hive is to be worked for extracted honey, a centrifugal honey extractor will also be needed. Additional useful articles are:—Scraper knife, for cleaning floor boards, frames, etc.; comb-uncapping knife, for use when extracting; a straw skep, for taking swarms; spare coverings of felt or carpet; a super-clearer, for clearing bees from section racks or supers.

There are many patterns of hives, all made to take the one British standard frame. A simple one should be chosen, possessing accuracy of workmanship and soundness of material, so as to stand exposure to the weather for years. The outside of the hive should be thoroughly painted, to keep it rain and damp proof. It must be placed on its stand in a spot sheltered, if possible, from the cold north and east winds, and with a free flight for the bees in front. Space should be left behind it for easy access, then all manipulations can be carried on from the back; this avoids irritating the home-coming bees.

The swarm should be ordered either from a recognised dealer or from a neighbouring bee-keeper. The only safe way for a beginner to start is with a "head" or first swarm. By this means he will avoid all the pitfalls of disease or lack of condition, which only a practised eye can detect, but which beset the purchaser of secondhand stocks. Given a good season, a swarm should be able to establish itself, and provide some surplus for its owner, in its first year.

When the box or skep containing the swarm arrives, it must be placed in the shade near the hive the bees are to occupy. The screws of the lid of the box should be taken out; or in the case of a skep the cording and wraps should be removed, and in the latter case the skep should be placed on a board, with a fair-sized stone under its edge, to allow of ventilation. The bees will soon quiet down, and cluster, after the shaking up of their journey, and thus will be in a condition for handling easily. In the early evening the hive must be prepared to receive them. The shallow frame lift or section-super should be taken away, leaving only a thin quilt over the frames, which have already been fitted with brood foundation. Then the front of the hive must be raised from the floor board about an inch, by means of two wedges. Next, a board, the width of the hive, is placed in front of, and level with, the

alighting board, sloping down to the ground. This temporary board and the alighting board are covered with a cloth hanging over the sides to the ground, to prevent bees from crawling underneath. Then the skep or box is taken between the palms of the hands, and carried mouth downwards, until it is just above the sloping board. With a smart jerk, the bees are thrown out in front of the hive, and they will at once begin to take possession of their new home. As they run in, watch should be kept for the queen. It is a satisfaction to see her safely enter her abode. When all are in, the wedges should be taken away, and the front of the hive lowered to its proper place. Crushing of any of the bees must be avoided. Any that are in danger may be cleared away with a feather. If the swarm has been a long time on its journey, or if the weather is bad on its arrival, the bees will be greatly benefited by being supplied with half a pint of warm, thin syrup, through an opening in the quilt and by means of the bottle-feeder. On the second day after hiving, the quilts should be turned back from the ends of the frames to ascertain if the "foundation" remains properly fixed, and to see if the work is going forward well. If this is the case the quilt may be taken off and the queen-excluder put on in its place. Over this a lift of shallow frames should then be placed and covered warmly with a quilt and carpets. The stock may now be left alone till the end of the honey season. More skill is required for obtaining comb honey in sections in good condition, but the section rack may be used instead of the shallow frames, if desired.

It is important that the beginner should clearly understand the principles that underlie successful bee-keeping. A colony of bees consists of a queen, a large number of worker bees, and (during summer) a certain proportion of drones. The strength of a healthy stock depends on the vigour and laying power of the queen, who is at her best in her second season, i.e., a queen hatched in June, 1904, is at her best in May, 1905, and should be replaced by a young one in 1906, either by natural swarming or by re-queening. Queens may be purchased, or raised by the methods taught in textbooks. The economy of a hive consists, first, on the keeping up of the warmth of the brood nest (by means of the heat evolved from the bodies of the clustering bees) to such a point as will stimulate the queen to lay eggs, and will enable young bees to be reared; secondly, on the feeding of the queen, and the nursing of the brood, and cleansing the cells for the queen's use; thirdly, on the obtaining of pollen, water, and nectar for the brood; lastly, on the building of storage combs and collecting nectar for the future supplies of honey.

The first three of these conditions must be fulfilled before the last can be begun; therefore, it is only by means of a large and vigorous surplus population that a stock can gather enough stores for its future use, and provide also for the bee-keeper. It is obvious that the aim of the bee-keeper is to keep his stocks strong, for a weak stock is always unprofitable.

The next consideration is that the crowded condition of the hive should be secured at the right time, *i.e.*, at the honey-flow. Honey is the concentrated nectar of flowers. Spring and early summer are the times when the land is gay with a wealth of blossom, and the honey crop is gathered. Late summer and autumn are times of seed and fruit, and only a gleanings of nectar from bramble and wild flowers then remains. There is a period every year, varying in each district, according to soil and altitude, when the supply of nectar is most abundant. This time should be ascertained by the bee-keeper, who will then stimulate his stocks beforehand, so that they may have their largest population ready to gather the produce of the various flowers.

Diseases are best guarded against by having dry, weather-tight hives and vigorous queens, and by giving suitable food when feeding is requisite.

The following are the chief maladies to be apprehended:—Dysentery, a disease of adult bees, is caused by undue winter confinement, unsuitable food, and damp hives; chilled brood and paralysis are caused by sudden frost in late spring, or by untimely manipulation; bee pest or foul brood is a terribly infectious disease, endemic in many places in England. A description of this disease is given in Leaflet No. 32, issued by the Board of Agriculture. A copy may be obtained, free of charge, from the offices of the Board, 4, Whitehall Place, S.W., or from any County Bee Association Secretary.

A word of warning and encouragement on one other point must be given. No one can keep bees without being stung. The sting of the bee is painful but harmless (except in rare instances), and in time, after many stings, the effect is so slight as to be quite disregarded. It is advisable to wear a veil to protect the face and head, but the hands should be left bare. Their best protection is the gentle, careful manipulation of the bees while attending to them. The foregoing is written for those who propose to keep a few stocks of bees. Any one intending to keep a large number of stocks is advised to get a season's instruction in a well-managed apiary before laying out capital in the business.

The British Bee Journal, price one penny weekly, and *The Bee Record*, twopence monthly, are the recognised organs of the bee industry in England; and the British Bee-Keepers' Association (Secretary, Mr. E. H. Young, 12, Hanover Square, London) is the headquarters of apiculture in the kingdom.

T. I. WESTON.

THE DUCK (concluded).

By D. F. LAURIE.

THE ROUEN.

It is generally conceded by fanciers that the Rouen duck is the "beauty duck" of all the breeds, with, of course, the exception of the small, ornamental breeds, such as Mandarins, Carolinas, and such like. Epicures are insistent that of all domestic breeds the Rouen is of the most desirable flavour, but this, of course, is stoutly combated by the champions of several other breeds. The breed most likely takes its name from the town of Rouen, in France, although it has been called the Rhone, and also the Roan duck. The latter is simply mispronunciation of Rouen. According to old writers the breed was in evidence early in the nineteenth century, and first became prominent as a breed in England during the fifties. There is strong evidence, however, that it was known in Sussex and parts of Kent at a much earlier date. Reviewing the opinions of writers, some with a knowledge of over half a century, it is very evident that this duck has suffered little at the hands of the fanciers since its introduction. In size, colour, and markings, even the conservative Mr. Harrison Weir freely admits very marked advance.

A prominent feature of the breed has always been the great depth of keel, due to the fact that it was largely used in France for the production of enlarged livers. The peculiar sluggish habits of the Rouen may have peculiarly fitted it for this purpose, or it may be that the sluggish habit has been acquired as an hereditary characteristic due to the fattening for the purpose stated. The weak point in this latter idea, however, is that specially fattened birds were not likely to be used for breeding purposes, and the hereditary tendency was not thus acquired nor transmitted. Excessive keel is not viewed with favour by the London poulterers, but for our local market I think the massive look would add to rather than detract from the probable selling value. This remark may be taken as applying to Aylesburys also, but not to keeled Pekins, because such birds are distinctly wrong.

The Rouen duck is said to be an inferior forager to the Aylesbury, but such habit is largely a matter of strain, as I have had good specimens which roamed all over my large garden in a short time, and appeared to me quite equal to Pekins and Aylesburys in this respect. We cannot look upon a highly fed, mammoth show bird as the guide to characters in any breed. One does not expect a twelve-pound-weight show drake, accompanied by his ten-pound mates, to travel around at the same pace as an active Indian Runner in search of the proverbial early worm. It is also stated that the ducklings of this breed are never so plump at eight or nine weeks as the ducklings of other breeds are, but that they are

very large then and still growing to such an extent as to preclude the laying on of fat and flesh. These statements (the authority is high) suggest that in the cases observed by the writers due care in selecting the breeding stock had not been exercised, nor had the ducklings the best food and attention. I know of Rouen ducklings, bred from Adelaide first prize winners, which were plump and meaty at eight weeks and three days, pairs averaging $11\frac{1}{2}$ lb. The cost of raising a pair of these ran out at 1s. 2d. (one shilling and twopence), with abnormally high prices for bran and pollard. Roughly ground wheat meal and bran, with bulk added in the shape of chaffed green food, was their principal diet. These are handy and very profitable weights. Twenty pairs were sold at 7s. (seven shillings) per pair just before Christmas, 1904. The ducklings when hatched are very attractive; yellow, marked with yellowish brown, and a dark line passing along the side of the face above the eye. Later on the colours fade, and the bird is less attractive, but not more so than other breeds at the ugly age. The only real objection to this breed as a table duck is common to all breeds with dark or partly dark plumage. If killed, as they certainly should not be, at a time when the moult is advanced, the quill feathers, which are difficult to remove, detract very seriously from its appearance, and while the white quill feathers of white-plumaged birds are accounted less objectionable, my contention is that the evil is but one of degree, and that the birds should have been killed before that stage arrived. The moment there is any appearance under the skin of these quill feathers it may be concluded that the time for killing is passing, and the wise feeder will not only have the ducklings fat, but killed, before this time arrives.

As layers the ducks vary according to strain. Some strains lay at an early age and lay early in the year. The egg is large and of good flavour. It may be noted that ducks which are fed on offal, or allowed to scavenge in insanitary gutters, acquire a disagreeable taint, both in flesh and eggs.

STANDARD.

The standard of the Rouen duck is as follows, and it is well to note it carefully, because the blood of this breed enters so largely into many strains of common ducks that novices are liable to be misled:—

THE DRAKE.—*Head and Neck.*—Head massive and heavy. Beak long, wide, and flat, well set on, in a direct line with the eye. Eye bold and bright. Neck long, gracefully carried, slightly curved, but not arched. Body as wide and long as possible, deep and square in keel, with good bow in front. Breast, broad and deep. Back long and broad. Wings large, well covered with flank and side feathers, carried in a line with body, flights resting gracefully on rump. Tail three inches in length, only 2 to $2\frac{1}{2}$ inches visible, composed of stiff feathers, with two or three curled feathers in centre. *Legs and Feet.*—Strong and massive in bone, medium length, well set, so as to balance body. Toes

straight, connected by the web. *General Shape and Carriage*.—Great length, broad and square, deep in keel, just clear of the ground from stem to stern. *Size and Weight*.—As large and massive as possible, from 9 lb. to 11 lb. *Plumage*.—Bright and lustrous.

THE DUCK.—Head, neck, and body as in the drake. Tail as in the drake, but without curled feathers. Legs and feet as in the drake. Size and weight as large and massive as possible, from 8 lb. to 9 lb. Plumage, bright and lustrous.

Colour in Drake.—Head and neck rich iridescent green. Beak bright green-yellow, with black bean at tip. Ring, perfectly white and clean cut, about an inch above the shoulder, dividing green neck and claret breast, not quite encircling the neck, but leaving a small space at the back. Back and rump rich greenish-black from the shoulders to the rump. Breast rich claret colour, quite free from white lacing or chain armour, coming well below and clean cut, not running into body colour. Flank and sides a blue, French-grey ground, very finely but distinctly pencilled with lustrous black, quite free from rust or white. Large coverts pale, clear grey, and small coverts French grey, finely pencilled. Pinion coverts dark grey. Bars composed of a purple-blue band, on each side of which is a narrow bar of black, then an outer bar of white, the three colours to be clear and distinct, making a striking and lustrous contrast of colours. Flights slaty black, with brown tinge, free from white. Stern same ground colour as flanks, boldly pencilled close up to vent, finishing in a curved line, perfectly free from white, followed by rich black feathers up to tail. Tail slaty black, with brown tinge. Tail coverts and curl feathers, glossy green back. Shanks and feet, bright brick red. *Colour in Duck*.—Head dark chestnut-brown, with a wide, brownish-black line from the base of the beak to the neck, two light brown strips running from the base of the bill above the eye on either side. Beak bright orange ground, with a black bean at the tip, also with a decided black centre mark on the upper part, which must not extend to base of the bill, the side edges, or to the bean. Neck same colour as the head, with a wide, brownish line running from the shoulders of the back of the neck, and shading to black at head. *Body*.—Down and under-colour black or dark brown. Ground colour rich golden or chestnut-brown, even in colour throughout, every feather, excepting wing bars and flights, distinctly pencilled from throat and breast to flank and stern with rich black or very dark brown. There should be a greenish lustre on the pencilling of the back, wings, and rump. The wing bars are the same as in the drake. Flights as in the drake. Tail chestnut-brown, pencilled with dark greenish-brown. Leg and feet dull orange-brown. In regard to the ground colour, however, many prefer a warmer brown, pencilled with rich, dark brown, and this is generally favoured. Similar ground colour and markings were characteristic of all the imported high-class specimens I have recently seen.

The question of judging Rouens is a nice one, so much so that there is a scale of points for both duck and drake, as follows:—

VALUE OF POINTS IN ROUEN DRAKE.

Defects.	Deduct up to.
Defects in head	5
Defects in colour of beak	5
Defects in neck	3
Defects in ring	5
Defects in colour of breast	12
Defects in colour of body	10
Defects in colour of back and rump	5
Defects in colour of wings	5
Defects in colour of tail	5
Defects in legs and feet	5
Want of symmetry	10
Want of size	20
Want of condition	10
<hr/>	
A perfect bird to count	100

VALUE OF POINTS IN ROUEN DUCK.

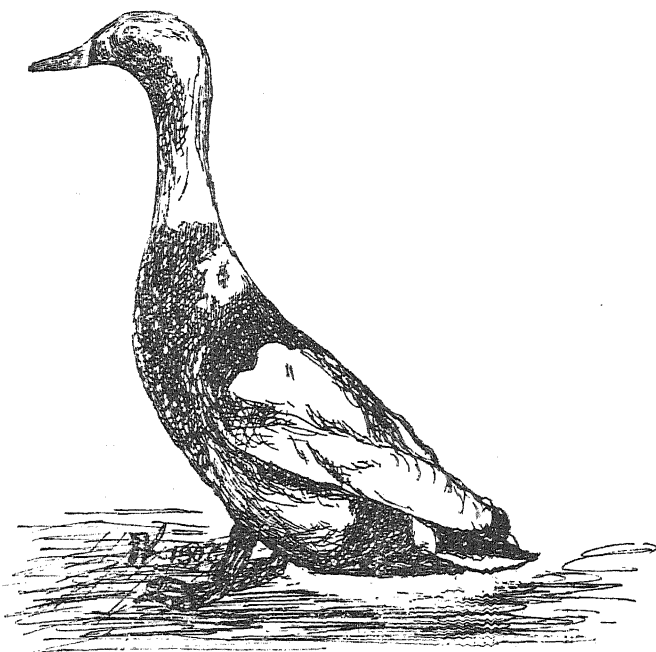
Defects.	Deduct up to.
Defects in head—shape 3, colour 3	6
Defects in colour of beak	10
Defects in colour of neck	4
Defects in colour of wing	5
Defects in ground colour	12
Defects in pencilling	20
Defects in legs and feet	5
Want of symmetry	10
Want of size	18
Want of condition	10
<hr/>	
A perfect bird to count	100

Serious defects, for which birds should be passed:—Leaden beak, crooked back, wry tail, or any other deformity; wing down or twisted; no wing bars; white flights; broken down in stern. In the drake:—No ring on neck, black saddle on beak. In the duck:—White ring, or approaching white, on neck.

THE INDIAN RUNNER DUCK.

This is, generally speaking, a modern bird. In England, its introduction took place less than sixty years ago. Their first home was in Cumberland, where in time they gained a great reputation for good laying and the habit of foraging for the greater part of their food. The

original birds from India had the characteristic upright carriage and peculiar running gait. This run is so characteristic of the breed that the late Mr. Henry Digby stated that this should be one of the tests in the show pen. Any duck that could not run, but had any approach to the waddle of the ordinary ducks, should be "passed." The first specimens in Australia were imported by the Hon. W. B. Rounsevell, some 10 or 11 years ago, and although that gentleman is one of our oldest poultry fanciers and breeders, and well experienced in ducks, the marvellous laying capacity of the ducks fairly staggered him—one duck, to quote his words at the time, literally "laid herself to death." They landed about December 20, and at the beginning of May Mr. Rounsevell had a fine flock of youngsters.



INDIAN RUNNER DRAKE.

The only account and illustration then extant was that of Mr. Simon Hunter, which appeared in "Poultry," and was reproduced in Adelaide. Mr. Simon Hunter declared the drakes to have green heads, which was a mistake. The original birds in Cumberland had been freely crossed with farm ducks, and such is the prepotence of the Indian Runner that many of these crossbreds passed muster with the unwary, the green cap in the drake and line on face of duck, showing the Rouen influence, which was further emphasised by an occasional claret breast. The birds now seen at our shows are a great advance on the first importations, and are of the proper colour.

The Indian Runner duck is a small bird, drakes $4\frac{1}{2}$ lb., ducks a pound less, and this is against them for table purposes, though the introduction of the cross gives a valuable crossbred—a fine layer and a very fair table duck, remarkable for its early maturity. These ducks lay a fine egg, which is much esteemed for its delicate flavour. The ducklings are hardy and precocious, the ducks laying at a very early age. As foragers they are marvels, and for ridding gardens of slugs, snails, and insect pests they are most valuable. They are wonderfully quick in all their movements, and are sharp-sighted even among ducks, so noted for their general alertness.

It has been stated that our climatic conditions tend to increase of size, but this, I think, should be controlled, because the value of the breed depends to a great extent on their activity, which a change in type will certainly affect and modify. The quick run, upright carriage, slim body, long, tapering neck, and long head, with the straight, wedge-shaped beak, are characteristics to be jealously guarded.

GENERAL CHARACTERISTICS OF INDIAN RUNNERS.

The head is flat to an extent which makes the eye appear at top of skull; the beak must run out a long, straight wedge, as dishing or concavity is a serious blemish. The bill is thick at the base, but of wedge shape—a long incline. The head, viewed sideways, is very long and fine. Neck as long and thin as possible from the base. Body long and narrow, without any indication of keel. Breast round and full. Back long and narrow. Wings carried close. Tail slightly elevated, with two or three well-curved feathers in that of the drake. *Legs and Feet.*—Legs set well back, causing the erect carriage of body. Toe straight, connected by the web. *General Shape and Carriage.*—Racy-looking, the body carried erect, somewhat after the form of a penguin. *Size and Weight.*—Drake, $4\frac{1}{2}$ lb.; duck, $3\frac{1}{2}$ to 4 lb.

COLOUR IN INDIAN RUNNER DUCKS.

In Both Sexes.—Head.—The head should be adorned with a cap and cheek markings of fawn or grey, to match body colour as near as possible; a narrow line of white divides the cap from the cheek marks, whilst a line of white, about an eighth of an inch, should divide the face of the bill from the head markings. Bill yellow when young, gradually changing to green in the adult bird, with a black bean at tip. Neck pure white from the head to where the breast markings begin, about $1\frac{1}{2}$ to 2 in. from the base of the neck. Back fawn or grey. *Wings.*—The shoulders and top parts of wings, fawn or grey; the flights white. Breast fawn or grey, evenly cut about halfway between the point of the breastbone and the legs. Fluff white, except an indistinct line of colour from the base of tail to the thighs. Tail fawn or grey. Legs and toes deep bright yellow. The colour of an Indian Runner, whether fawn or grey, should be uniform throughout the whole of the sur-

face plumage, except the tail of the drake, which is darker. The fawn or grey of the shoulders, top part of wings, and tail should be in the shape of a heart pressed flat on the back. As regards colour, fawn is that favoured by Mr. Digby, and is, I think, correct, for it is the original colour.

VALUE OF POINTS IN INDIAN RUNNER DUCKS.

Defects.	Deduct up to.
Defects in head, eyes, and bill	15
Defects in head markings	10
Defects in neck and neck markings	10
Defects in body	10
Defects in body markings	25
Defects in legs	5
Want of symmetry, typical carriage, and condition ...	25
A perfect bird to count	100

Serious defects, for which a bird should be passed:—Claret breasts, blue wing bars, horizontal carriage or shape, absence of feathers from the flights or any other part of the body, twisted wings, wry tail, or any other deformity.

THE BUFF ORPINGTON DUCK.

This breed has come into great prominence of late, through the medium of the New South Wales duck-laying competition. The breed is one of several of recent origin, and is due to the late Mr. W. Cook, of Orpington fowl fame. Already the breed has become popular, and if half the good qualities claimed can be substantiated the introduction should prove of great value to the poultry industry. The history of their manufacture has never been given, and the component breeds are not definitely known. Mr. J. C. Coupe, a veteran fancier, told me some years ago, when reviewing the Buff Orpington fowl, that he had seen many buff fowls (Lincolnshire buffs), buff ducks, and buff geese in parts of England. Doubtless, Mr. Cook obtained specimens of some of these buff ducks for fixing colour on his Buff Orpington ducks, just as he availed himself of Lincolnshire buffs in the manufacture of Buff Orpingtons. Mr. Cook stated that Indian Runners had contributed a good share, and some are of opinion that the blue duck (either Blue Swedish or Blue Orpington) had also been inter-crossed. Some strains are said to have included Rouen, and this may be so. Where so many breeds of ducks are to be found, as in parts of the old country, an energetic breeder will often find ample material for perfecting his work in creating new colours or types. The enthusiasts claim for this breed that it is an improvement on the Runner, being more uniform in shape, larger, a self-colour, larger eggs, but retaining the active temperament of the Runner. This is, of course, one view; but it would be remarkable if a bird of composite origin should be more uniform in shape than Indian Runners of pure origin.

The colour is between a buff and a fawn, should be even, but not so rich or deep as in buff fowls. This is the ideal, and those who know the trouble with buff fowls will appreciate the fact that the boasted superiority of a self-coloured fowl or duck is one of doubtful value. The beak is a lighter brown in the drake than in the duck, and should not be too wide. The eye is dark, and becomes darker the second year. The head and beak should be long, neck long and thin, nicely arched, breast deep, feathers fitting close to body; no rough feathers. It is, of course, too early in the day to do more than call attention to this breed, and state that several breeders are finding the ducks lay well, and the ducklings growing in a satisfactory manner.

THE CAMPBELL DUCK.

This is a breed, so far as I am aware, unknown in Australia, and bred to a limited extent only in England. The breed was originated by Mrs. Campbell, of Uley, in Gloucestershire, and is similar in colour to the Rouen, but very light in colour, and small as regards size. Stock birds weigh from $4\frac{1}{2}$ lb. to 5 lb. The flavour of the flesh resembles that of the wild Mallard, which was used as one of the crosses. In colour they resemble the Rouens, but are much lighter, with a plain head of greyish-brown, without the eye streak. The drakes have yellow legs, a grey back, and claret breast. As layers these ducks are stated to be in the front rank.

THE KHAKI-CAMPBELL.

This is a more recent attempt on the part of Mrs. Campbell. The drake is khaki colour all over, except head and stern, which are bronzy-green. The duck is entirely khaki in colour, each feather delicately laced with buff. The duck has many of the characteristics of the Runner, and the young ducks are very early layers.

BLUE DUCKS.

The Blue Orpington duck has been bred in New South Wales for nine or ten years, and I saw a good many of them there. They are large ducks and good layers, and many points are claimed in their favour. They did not strike me as very attractive, and, for one, I should require to know much more in their favour before becoming convinced of their value. Blue ducks are known in the North of Germany, Denmark, and Sweden, and, as Blue Swedish ducks, have been bred for years in America. Like Buff Orpington and Campbell ducks they have neither official recognition nor standard.

THE MUSCOVY DUCK.

This duck is not descended from the Mallard, as is believed to be the case with many of our domestic breeds of duck. It is a native of South America, and is not found wild elsewhere. In America it was at one time a favourite, and was much used for crossing for table-bird

breeding, but changes in trade have lessened its value. Sydney breeders used it for breeding market ducks to a large extent, and here I have seen and bred some very fine early crossbred ducklings. A notable feature is the disparity in size and weights of duck and drake; the latter frequently weighs 11 lb. and over, the duck 6 lb. or 7 lb. The drake is minus the curled tail feathers usual in other breeds, but has large, fleshy carunculations on the head, the vivid scarlet of which, contrasted with the green in the eye, gives the bird a savage appearance, which he earns by general quarrelsomeness, as they are great fighters, and a nuisance among other poultry. In colour they vary from pure white to black, and black and white, and occasionally blue dun. The legs are yellow, and the toes are armed with sharp claws. The feathers are large, broad, and carried very loosely. The eggs are large, but the duck has no great reputation as a layer.

THE CAYUGA DUCK.

This breed promised at one time to take a high rank, both on account of its beauty, and also as a layer and table bird of high quality of flesh and early maturing. However, although specimens have long existed in all the States, the breed has made but little progress, and the fact that in England it is merely an exhibition duck, with extraordinary development of keel, must tell against its favour in the market. Some years ago I answered several enquiries, and believe specimens were introduced, some of high quality. As now bred, the Cayuga is similar in size and shape to the Aylesbury. The plumage is a rich black, well glossed with green, the bill lead colour or bluish black, with a black splash in the middle, and a black bean at tip. The legs are sooty-orange. The flesh is white, and of good quality, but, of course, the black feathers are sure to lead to trouble unless great care is exercised.

There are other breeds of ducks, both utility and fancy breeds, but no good purpose would be served by describing them, as they are unlikely ever to affect our poultry industry. It may, of course, be the case that there are Continental breeds much superior to any we know as regards suitability for commercial purposes. Time alone can show whether this be so or not. These remarks are prompted by the recent importation of some remarkable Russian ducks (frozen) to Sydney.

EXHIBITION DUCK-BREEDING.

I do not propose at the present time to give this matter lengthy consideration, but will state a few general principles. The ideal soil is sloping and sandy, with abundance of sharp grit. This is so for ducks under any circumstances, and where ordinary soils of varying descriptions are to be considered due provision for drainage must be made, and a full supply of sand, gravel, and grit provided. To gain success one must start with the best strains procurable, for at the present time the general quality of our show ducks is very high. As a rule, a drake may

have five ducks, and the heavy breeds require a small pond of clean water, as, failing a pond, there is a lack of fertility in the eggs. A moderate course of feeding, with a fair run and plenty of grass and green food, and a moderate supply of animal food should result in fertile eggs which will give strong, robust ducklings. On no account over-feed or force the stock birds. Get specimens from a reliable source and of a strain which produces large, healthy specimens. Select thoroughly typical birds, of medium size, and active. You will get but poor results from mammoth, over-forced, show specimens, but you can breed such from medium stout birds if you feed for size.

FOR HOUSEHOLD PURPOSES.

Where a supply of duck eggs for cooking and plenty of ducklings throughout the greater part of the year are wished for, it is recommended to use as breeding stock medium-sized specimens of Rouen, Pekin, or Aylesbury, pure or crossed. The laying will depend on the strain. If they are good layers a long period of duckling production can be obtained. The Pekin-Aylesbury is an excellent cross, so is the Pekin-Indian-Runner, using smallish Pekin ducks and Runner drakes. Give a nice run, and keep the birds clean. As much green food as possible gives the best results, and by all means a well-constructed pond for the birds to wash in, etc. Those in rabbit-infested country will find the most valuable item of food available at small cost. In the neighbourhood of butter factories and creameries separator milk, which has a high feeding value, is to be obtained at a nominal figure. Green food should be grown in abundance, and the general food should include bran and pollard, and ground grain of all sorts. Potatoes may, if cheap, form a considerable portion of the fare. Ducks need but little space, but, although they may be stocked much heavier than fowls, the practice of shifting to new ground, while the old ground is spelled by cropping, should be observed. Light netting hurdles, two feet high, are all that are needed to confine the birds, and these hurdles may be made so that the small posts can be pulled up without unfastening the netting, removed, and refixed in a short time. The houses should be long, low, and cool, and of very cheap construction. Thatch is very good, but, as I need hardly point out, is dangerous in this land of bush fires. Ducks are not troubled with vermin as fowls are, and there is less occasion for iron houses. A cool house is what is required.

Do not forget to guard against foxes, cats, stray dogs, etc. Keep a good watch dog, and on signs of danger set gin and other traps. For hawks, erect a few posts 10 feet high, and on the top of each place a rabbit or dog trap chained to the post. Hawks select such a spot to alight upon while inspecting your stock.

HATCHING AND REARING DUCKLINGS.

The eggs may be set under hens or turkeys where only a few hundred or less are required. For operations on a large scale, use incubators,

running them at a degree lower temperature than for hens. The thermometer must be accurate, and this is the trouble. Hatch otherwise as directed by incubator manufacturer, and let the ducklings alone for from 20 to 24 hours after hatching.

Even when hatched by a careful hen, it is the better practice to remove the ducklings when dry, and place in a small box until ready for the first feed. With large numbers, they may be put in a foster mother, using but little heat, not more than 70 degrees. They do excellently in a cool mother, provided with small runs, which should be placed in dry, well-drained ground. Feed little and often, and give water or milk and water regularly, but not too much, nor leave it long, as the ducklings may over-indulge. Place the food and water so that the ducklings cannot tread in either. To this end small wire gratings or grids may be made. Various sizes are required for different-sized ducklings, to enable them to thrust their heads, but not bodies, through to the food and drink. They will then remain dry and clean, and will thrive all the better. Long sheds about ten feet wide, as used in England, are certainly the most convenient for rearing for table purposes. Partitions made of boarding about 18 inches high and movable are used, and the ducklings kept in flocks of 50—a 6-ft. space is ample until half-grown. Market ducklings require little, if any, exercise, and should be kept on clean straw (such as wheat chaff), and on no account frightened. A variety of food may be used, as long as it is of good quality—the selection being largely governed by price. In using separator or skim milk it is better to mix it with the soft food—if given as a drink the bird may get sore eyes, and should the milk go sour when the ducklings have been accustomed to sweet milk, there will be trouble. Various foods are recommended, and when the business is undertaken on a large scale the cost of the respective foods is an item which requires careful consideration. A hand mill is a convenience, so that barley, oats, wheat, etc., can be ground and mixed as desired. Clear but untainted eggs from the incubator may be well beaten with milk and used for moistening oatmeal, barley meal, or even bread crumbs; the latter is excellent for the first week, and is really not as expensive as it appears. The second week, mix a little shredded meat, or liver, and soup with the foods. Keep clean grit and sharp sand in abundance at all times. Cut green food, well chaffed, will be consumed in quantity. Keep up careful and moderate feeding, observing great regularity, and the birds will come along in a gratifying manner. Add more meat to the mash as the birds grow, the American practice being to add the meat gradually, until say, at six weeks, it forms one-tenth part of the food. Many breeders mix carefully washed and dried coarse, sharp sand with the food from the start, and the general practice of supplying chicks and ducklings with sand for a first feed is a good one. Feed about every two to two and a half hours.

By carefully following the above suggestions the majority of the birds should, at from 8 to 9 weeks, be in prime condition, and averaging

not less than 5 lb., frequently more. A little experience will ensure heavier weights, and such birds will find a ready sale locally, and will also be well suited for export. The cost of rearing depends on the rearer, and can be kept much lower than is generally stated. The profits, of course, depend likewise on the individual.

A great deal more might be written on this subject, but sufficient has been said to ensure success. Make it the golden rule in breeding ducklings for market to get them in prime condition at the earliest moment, and then market them. If all things are carefully attended to profit must result. Remember, however, that, all things said and done—in duck-breeding, as in every other industry—there is one central pivot, which guides, controls, and takes the strains and stresses of the whole, and on which success or otherwise depends, and that pivot is the individual. This is the great secret we hear so much of, and which resolves itself into the proper application of knowledge and information nowadays readily obtainable.

ROSEWORTHY EGG-LAYING COMPETITION, 1905-6.

By W. R. DAY.

Although the weather during the past month cannot be said to have been conducive to good laying, it is satisfactory to note that the fair start made by the fowls has been maintained, as a gradual increase in number of eggs laid has taken place, instead of a falling off, as was the case last year for a number of weeks after the arrival of the birds. Owing to the almost continuous light showers experienced, the yards have remained in a damp condition, but as the soil is of a porous nature the water soon soaks away, so that the yards are never in a sloppy condition. As there is always a fair quantity of litter about, the fowls are able to keep almost dry-footed. There should, therefore, be little risk of any sickness resulting from the dampness prevailing. With the exception of one hen suffering from rheumatism all are in a fine, healthy condition, though several are going through their moult. Two of the birds in Pen 28, after having laid a few eggs here, have shown a desire to remain on the nest, but as the weather is hardly suitable for broodiness a few days in solitary confinement will probably be sufficient to cool their desire to sit.

The total number of eggs laid for the first month of the competition up to and including June 19 is 1,347, and compares more than favourably with the number laid during the corresponding period of last year,

which was 549, thus showing an increase of 798. The following table gives the record of each pen:—

Pen.	Breed.	Competitor.	Eggs Laid for Month.
1	White Leghorn	C. W. L. Muecke	28
2	White Leghorn	A. H. Padman	97
3	White Leghorn	Sargenfri Poultry Yards	14
4	White Leghorn	Kia Ora Poultry Yards	26
5	White Leghorn	Thos. Parish	11
6	White Leghorn	Ontario Egg Farm	99
7	White Leghorn	J. Von Bertouch	27
8	White Leghorn	Leonard C. Dobbie	11
9	White Leghorn	Briarleigh Poultry Yards	16
10	White Leghorn	Chas. Foot	14
11	White Leghorn	Allowah Poultry Farm	60
12	White Leghorn	A. E. Kinnear	24
13	Silver Wyandotte	Piralilla Egg Farm	41
14	Silver Wyandotte	W. A. E. Smith	26
15	Silver Wyandotte	Norman Brookman	36
16	Silver Wyandotte	John G. Balfour	93
17	Silver Wyandotte	D. W. Bartlett	73
18	Silver Wyandotte	Hector J. Dobbie	83
19	Silver Wyandotte	Yenda Poultry Yards	61
20	Golden Wyandotte	P. W. Mellor	52
21	White Wyandotte	Chas. Wright	50
22	White Wyandotte	J. & A. Gibbons	46
23	Black Orpington	Utility Poultry Yards	23
24	Black Orpington	F. J. Wimble	90
25	Black Orpington	W. F. Krummell	24
26	Black Orpington	Jas. Francis	8
27	Buff Orpington	R. Laidlaw	49
28	White Orpington	Norman Brookman	54
29	Minorcas	Penglase Bros.	7
30	Black Andalusian	W. F. Evenden	36
31	White Leghorn	H. Dix	68
			1,347

The feeding has been on the following lines:—7 a.m., hot mash, bran and pollard; 12 noon, green feed and bone, or a little grain thrown into the litter; 4.30, grain, in the shape of wheat, maize, and oats. The quantities of grain given the different breeds vary from 30 to 44 oz. per day, and a variation also takes place in pens of the same breed. This is due to the fact that those birds that are laying require more than those that are not laying, and, again, some birds will consume more feed than the others. For instance, the White Leghorns consume from 30 up to 33½ oz. per pen for the day; Wyandottes, Minorcas, Andalusians, 38 oz.; and Orpingtons, 44 oz. per pen daily; the total quantity of food consumed daily being 71 lb. 6 oz., as against 65 lb. 4 oz. used during the first week, and a further increase in quantity will probably take place as the energy of the hens becomes taxed to a greater degree.

RESULTS OF ROSEWORTHY EGG-LAYING COMPETITION, 1904-05.

The following short *résumé* of operations and results in connection with the above competition may be of interest to some. This competition, which is the second promoted by the Royal Agricultural and Horticultural Society of South Australia, was started on May 15, 1904, and finished on May 14, 1905, with 31 pens, representing the following breeds:—White Leghorn, 5 pens; Brown Leghorn, 3 pens; Buff Leghorn, 3 pens; White Wyandotte, 2 pens; Golden Wyandotte, 2 pens; Silver Wyandotte, 2 pens; Black Orpington, 3 pens; Buff Orpington, 2 pens; Minorca, 3 pens; Silver Campine, 2 pens; and 1 pen each of Black Hamburg, Langshan, Black Spanish, and Ancona.

Pen.	Owner.	Breed.	Weight of Fowls at		Eggs Laid.
			Arrival.	Finish.	
			lbs. oz.	lbs. oz.	
1	Mrs. S. Butler ...	White Leghorn	21 13	23 0	1,020
2	T. E. Crompton ...	White Leghorn	29 5	29 0	742
3	W. S. & T. E. Dean ...	White Leghorn	30 8	30 0	598
4	Sunnyhurst Egg Farm ...	White Leghorn	23 6	26 0	1,251
5	A. H. & J. E. Padman ...	White Leghorn	23 14	24 0	707
6	W. D. & L. T. Hammatt ...	Brown Leghorn	19 10	22 0	598
7	H. P. Marshall ...	Brown Leghorn	21 6	25 0	721
8	J. Hunter, Jun. ...	Brown Leghorn	21 0	23 0	501
9	C. Foot ...	Buff Leghorn	16 5	19 8	928
10	Sargenfri Poultry Yards ...	Buff Leghorn	21 7	23 0	748
11	T. E. Yelland ...	Buff Leghorn	21 5	24 0	668
12	W. C. Bennett ...	White Wyandotte	23 12	27 0	682
13	H. M. Pugh ...	White Wyandotte	24 8	29 0	531
14	P. W. Mellor ...	Golden Wyandotte	23 5	28 0	436
15	L. H. Muecke ...	Golden Wyandotte	18 14	24 0	521
16	T. B. Robson & Son ...	Silver Wyandotte	26 10	31 0	660
17	W. A. E. Smith ...	Silver Wyandotte	22 13	26 0	950
18	J. G. Balfour ...	Buff Orpington	31 12	36 0	750
19	R. Laidlaw ...	Buff Orpington	35 4	35 0	643
20	Chart Trading Co. ...	Black Orpington	34 4	36 0	712
21	A. H. Tyler ...	Black Orpington	28 9	30 0	937
22	F. J. Wimble ...	Black Orpington	43 4	38 0	626
23	J. Bower ...	Minorca	27 12	29 0	316
24	Penglase Bros. ...	Minorca	22 2	26 0	937
25	Alfalfa Poultry Yards ...	Minorca	26 7	27 0	616
26	J. H. Hobbs ...	Silver Campine	21 4	23 0	499
27	J. Smith ...	Silver Campine	21 0	21 0	520
28	P. & A. Fulwood ...	Black Hamburg	17 2	18 0	700
29	G. Hassell ...	Langshan	34 0	36 0	793
30	J. Kluge ...	Black Spanish	18 6	21 0	616
31	Dr. H. H. Russell ...	Ancona	16 10	20 0	786
					21,713

The six White Leghorns from the Sunnyhurst Egg Farm, Clarendon (W. L. Williams, owner), laid 1,251 eggs, or an average of 208½ each, for the year, and won the first prize of £10 for largest number of eggs laid, and also the first prize of £10 for highest market value, which was £3 14s. 1d. The second prize, of £5, for number laid, was also won by

White Leghorns, with 1,020, owned by Mrs. Butler, Ridleyton North. The second prize, of £5, for value, and third prize, of £2, for number of eggs laid, was won by Mr. W. A. E. Smith's Silver Wyandottes. The Orpingtons and Minorcas also laid fairly well. The site selected for the pens at the Roseworthy Agricultural College was an excellent one in every sense of the word, as a plantation of carob trees (*Ceratonia siliqua*) of good growth was so divided as to enclose three or four trees in each pen, which measured 24 ft. x 24 ft. The trees are useful in that they shelter the fowls to a great extent from the cold, rough weather of winter, and also provide good shade during the hot weather. The extreme temperature early in the year, ranging from 107° to 119°, killed a large number of fowls all through the country, but not one of the competition fowls succumbed. The total death roll during the year was five, but otherwise the fowls kept in good health right through, and were returned to their various owners in the same healthful condition in which they were received at the beginning of the contest. The feeding has been conducted on much the same lines right through the year regarding the quantities given, although the variety has been changed according to the season, maize, peas, and oats being used for grain feed during the colder weather, and wheat, oats, and torrefied barley during the warmer period. The morning meal, given at 7 o'clock, was a mash of bran and pollard, of 2 to 1 proportion, on four mornings, with 8 lb. of liver boiled and crushed, added, which was then mixed with the soup in which the livers had been boiled; on the other three mornings of the week hot water only was used for mixing. The quantities per pen varied from 15 oz. to 24 oz., according to the breed of fowl. The midday meal consisted of crushed bone and meat scraps, about 3 oz. per pen, with 6 oz. of green feed, such as milk thistles, cabbage leaves, rape, silver beet, lucerne, and pie melon, a change being made each day when possible. The evening meal of grain was given at the rate of 5½ oz. to 8 oz. per pen. The quality of all food used has been of the very best obtainable; nothing musty or stale or withered has been used at any time. Fresh water daily, in clean vessels, and a good supply of grit and charcoal always available, have helped to provide a bill of fare apparently agreeable to the fowls. The weights of the fowls show an average increase of 5½ oz. per head. This should certainly dispel any notions as to the fowls being either over or under fed.

Value of eggs laid (average price, 7d. per dozen) ...	£58	7	4
Cost of feed	28	4	2
Total profit	£30	3	2
Value of eggs per hen per year	£0	6	3
Cost of feed	0	3	0
Profit per hen of	£0	3	3

LIME NITROGEN.

From *The Journal of the Board of Agriculture*, England.

The discovery of a means of fixing the free nitrogen of the air in a way which makes it available as a manure was referred to in an earlier number of *The Journal of the Board of Agriculture* (England), (March, 1904, p. 506). The method employed by the inventor, Dr. Frank, is to obtain, in the first place, nitrogen from the atmosphere by passing air through vertical retorts or cylinders containing copper shavings, and heated to a temperature of about 400° C. In passing through these cylinders the oxygen of the air is taken up by the copper, and the nitrogen is conveyed in pipes to a retort, which is heated by an electric furnace to 700-900° C., and filled with calcium carbide. The nitrogen is absorbed by the carbide, and forms calcium cyanamide. The crude product, known in Germany as lime nitrogen (Kalkstickstoff), takes the form of a black powder, similar to basic slag, and contains about 20 per cent. of nitrogen. It is at present only being manufactured on a small scale, but if it can be produced cheaply enough it is likely to be a competitor to nitrate of soda and sulphate of ammonia. One important factor in its manufacture seems to be the possession of a cheap means of producing electricity, as calcium carbide, the substance with which the nitrogen is combined, is made by heating chalk and some form of carbon in an electric furnace. Experiments to test the manurial properties of this substance were carried out in 1901-3 by Professors Gerlach and Wagner at the experiment stations at Darmstadt, Posen, and elsewhere, and Dr. Gerlach put the comparative effect of lime nitrogen at 74 per cent. of that of nitrates. On some land and under certain conditions it was found to be injurious, for instance, when applied as a top dressing to quite young plants, and again on land inclined to sourness. Dr. Frank, of the *Cyanid Gesellschaft*, gives the following directions in regard to the use of this material:—(1) The amount applied should be from 1 to 2½ cwt. per acre, according to the condition of the soil; (2) it should be mixed with about twice the quantity of dry earth; and (3) it should be broadcasted a week or a fortnight before seeding, and the soil immediately lightly ploughed so as to bury the manure to a depth of 3-5 inches.

During the past year a number of experiments have been carried out with this material, and the results show that lime nitrogen is likely to prove a satisfactory nitrogenous manure.

NITROGEN-GATHERING BACTERIA.

As previously announced, samples of the cultures of nitrogen-gathering bacteria were obtained from the Department of Agriculture of the United States of America for experiment in this State. Cultures for red clover and for peas were obtained, and arrangements were made to test the former at Mount Gambier, Millicent, and Conmurra, and the latter at Mount Gambier and at Gumeracha. With the exception of the last-named locality, the work has been undertaken

by members of the Agricultural Bureau, while at Gumeracha the South Australian Company are carrying out the experiment under the direction of the Secretary for Agriculture. Although the wet weather experienced during the month of June has caused considerable delay, it is anticipated that by the time this appears all the plots will have been sown. The following is an outline of the scheme of the experiments:—

<p>PLOT 1. Soil and Seed Untreated. No Manure.</p>	<p>PLOT 6. Soil and Seed Untreated. Manured with $1\frac{1}{2}$ cwt. per acre Bone Super.</p>
<p>PLOT 2. Seed Treated. $1\frac{1}{2}$ cwt. per acre Bone Super. 75 lb. Nitrate Soda.</p>	<p>PLOT 7. Seed Treated. No Manure.</p>
<p>PLOT 3. Seed Treated. $1\frac{1}{2}$ cwt. per acre Bone Super.</p>	<p>PLOT 8. Soil Treated. $1\frac{1}{2}$ cwt. per acre Bone Super.</p>
<p>PLOT 4. Soil Treated. $1\frac{1}{2}$ cwt. per acre Bone Super. 75 lb. Nitrate Soda.</p>	<p>PLOT 9. Soil Treated. No Manure.</p>
<p>PLOT 5. Soil and Seed Untreated. $1\frac{1}{2}$ cwt. per acre Bone Super. 75 lb. Nitrate Soda.</p>	<p>PLOT 10. Soil and Seed Untreated. No Manure.</p>

Plots in each case are approximately one-sixth of an acre, with path between each. The actual measurements of the plots vary according to the shape of the whole block.

It will be seen that these experiments cover more than general tests of the value of inoculation with nitrogen bacteria. Plots 1 and 10 are duplicates of each other, the seed being put in without any treatment and without manure. Plot 6 should show the benefit of the application of a phosphatic manure, and Plot 5 the value, if any, of the addition of nitrogen, in the form of nitrate of soda. Plots 7 and 9 compare with Plots 1 and 10, but in one instance the seed has first been moistened with the preparation containing the nitrogen-gathering bacteria, and in the other some soil similarly treated has been applied. In the same way Plots 3 and 8 compare with Plot 6, and Plots 2 and 4 with Plot 5.

It must be remembered in connection with these experiments:—

(1) That if sufficient bacteria are naturally present in the soil the treatment may show no increase in the crop; (2) that the crop will only be benefited by the action of the bacteria in the absence of a natural supply of nitrates in the soil; and (3) that without a sufficient supply of phosphates in the soil the bacteria will have no beneficial effect.

FARM ACCOUNTS.

(Continued from page 682.)

By F. W. RUSSACK.

Now and again we hear of a wonderful system of accounts so perfect that at ten minutes' notice the user can tell you not only his exact financial position, but also his profit up to date. Such a system may suit a grocer or a draper, whose turnover is frequent, whose profits accumulate regularly and constantly, and whose books are kept by a clerk employed for the purpose. With the farmer, however, the case is quite different. His turnover is not frequent, nor are his profits regular and constant. He has to wait at least twelve months for his returns, and it is not until his crops are harvested or his wool in bales that he can speak with any degree of certainty of his gains or losses. Moreover, the average farmer has comparatively few entries to make, and he wants the final results of his bookkeeping only once a year. Still, even this presents difficulties that the ordinary business man does not know in practice. It is much easier to keep books that call for constant and regular attention than to keep those in which entries are made only occasionally. The farmer has his own special needs in the way of accounts. The complex methods and numerous columns suited to other lines of business are directly opposed to the nature of his calling. What he wants is a system of accounts that must be—

1. Based on simple entries made at odd times;
2. Suited to his business as a farmer; and
3. Capable of a complete analysis once a year, preparatory to drawing up the Balance Sheet and Profit and Loss Account.

As these notes are written for those who have no previous knowledge of the subject, it will be necessary, before outlining a system of accounts fulfilling the above requirements, to furnish the learners with explanations and illustrations of the definitions and rules of ordinary bookkeeping. The following instructions should be very carefully studied.

Accounts are brief records of business transactions. They may be considered under the following heads:—

- I. Cash Account
- II. Bank Account.
- III. Real Accounts.
- IV. Personal Accounts.
- V. Nominal Accounts.

I. CASH ACCOUNT.

The two sides of a Cash Account are marked "Dr." and "Cr." respectively, "Dr." being placed on the left side and "Cr." on the right side. "Dr." means debtor, and really denotes a person who owes something. "Cr." means creditor, and denotes a person to whom something is owed. In keeping a Cash Account the following rules should be observed:—

1. Write on the "Dr." side the date and the amount of money you have on starting.

Dr.

1904. Jan.	1	To Capital	£100	4	6
---------------	---	------------	-----	-----	-----	------	---	---

Before every entry made on the "Dr." side write the word "To."

2. Put on the "Dr." side all the entries for money that "comes in" and nothing more. In making an entry, write the name of the person from whom you receive the money, or some other words to show how you obtain it.

3. On the "Cr." side put all the entries for all the money that "goes out"; that is, all the money you pay away.

4. At the end of a certain period it becomes necessary to balance the account. This is done as follows:—

(1) Add up both sides.

(2) Find the difference.

This is called the balance, and if your records are correct it should be equal to the cash in your possession at the time. When there is no difference between the two sides of an account they may be added up and ruled off. There is then no balance to bring down, and the account is said to be "closed."

(3) Enter the balance on the lighter side of your Cash Account, and see that the totals on the "Dr." and "Cr." side agree before you write them in with ink.

(4) Rule off and bring the balance down to the opposite side, and below the double line, using as a date the first day of the new period. When there is only a single line left on the page, a new heading is made on the next or some other page, and the totals are carried forward to it.

A balance that is first entered on the "Cr." side and then brought down to the "Dr." side is called a "debit balance."

It should be remembered that in a Cash Account the balance must always fall on the "Cr." side. If it does not, then you have spent more money than you had to spend; which is impossible.

II. BANK (CURRENT ACCOUNT.)

A Bank Account is kept in an exactly similar manner to a Cash Account. The balance represents the amount you have in the bank at the time. In the Bank Account, as in the Cash Account, the balance should fall on the "Cr." side; but it is possible for your Bank Account to show a balance on the "Dr." side if the banker is willing to allow you an "overdraft."

Suppose a farmer has the following memoranda in his Pocket Book:—

1905.

Jan. 1.	Cash in hand	...	...	...	£305 18 11
Jan. 3.	Sold bull for cash	...	...	...	15 0 0
Jan. 8.	Paid rent for half-year, cash	...	...	...	25 0 0
Jan. 10.	Sold wheat for cash	...	...	...	125 10 10
Jan. 15.	Opened current account at bank, paying				
	in	...	...	...	400 0 0
Jan. 17.	Bought wagon, by cheque 1	...	...	...	45 0 0
Jan. 25.	Paid household expenses, cheque 2	...	...	...	15 0 0
Jan. 28.	Sold sheep for cash	...	...	...	30 15 0
Jan. 30.	Paid into bank, current account	...	...	...	50 0 0
Jan. 31.	Paid wages, cheque 3	...	...	...	10 0 0
Jan. 31.	Paid taxes, cheque 4	...	...	...	2 10 0
Jan. 31.	Drew cheque 5, for cash	...	...	...	10 0 0

These could be written up thus:—

Dr.							Cash Account (John Prosper).							Cr.		
1905.							1905.									
Jan.	1	To Capital	...	305	18	11	Jan.	8	By Rent	...	25	0	0			
"	3	" Bull	...	15	0	0	"	15	" Bank (cur-	rent A/c...	400	0	0			
"	10	" Wheat	...	125	10	10	"		" " "	...	50	0	0			
"	28	" Sheep	...	30	15	0	"	30	" " "	...	12	4	9			
"	31	" Cheque 5	...	10	0	0	"		" Balance	...						
				£	487	4	9					£	487	4	9	
1905.																
Feb.	1	To Balance	...	12	4	9										

Bank (Current Account).

1905.							1905.						
Jan.	15	To Cash	...	400	0	0	Jan.	17	By Cheque 1..	45	0	0	
	30	" "	...	50	0	0		25	" " 2.	15	0	0	
								31	" " 3..	10	0	0	
								31	" " 4...	2	10	0	
								31	" " 5...	10	0	0	
								31	" Balance ...	367	10	0	
				£	450	0	0			£	450	0	0
Feb.	1	To Balance	...	£	367	10	0						

Every farmer should keep a Cash Account, even if he attempts nothing more in the way of bookkeeping. Most farmers have a Banking Account, and look to the Bank Passbook as supplying the place of a Cash Account. Now, if a farmer decided:—

1. To pay every penny into the bank as he received it;
2. To keep a record of his receipts; and
3. To make all payments by cheque,

then the Passbook, together with counterfoils of the cheques drawn, and the record of his receipts, would enable him to trace his cash, and write up an account of it at the end of the year. This, however, is a practice

that cannot be recommended. It is much simpler and more businesslike to keep a Cash Account and a Bank Account, both regularly written up to date, and balanced at the end of each month.

III. REAL ACCOUNTS OR ACCOUNTS OF PROPERTY.

These accounts have a name which explains itself; for example, Capital Account, Implement Account, Live Stock Account, etc.

Real Accounts must be distinguished from accounts of persons or Personal Accounts, as they are called. In dealing with Real Accounts, the following rules must be observed:—

1. Each account must be opened on the "Dr." side, just as in the Cash Account, *i.e.*, by entering the amount and value of the goods of that particular account which you have in hand, just as if you were paying it into the account.

2. After the first entry all goods, stock, etc., which "come into" a particular account are entered on the "Dr." side, while all goods, stock, etc., which "go out" are entered on the "Cr." side.

3. The final entry (which is not given in a Cash Account) is made by stating the amount and value of the goods or stock which remain in hand at the close of the year. This entry, with the final date, is put on the "Cr." side.

4. The account is now balanced. As before, the balance will fall on the lighter side, which may be either the "Dr." or "Cr." side. In the case of a Real Account, the balance represents a gain or a loss. If the balance falls on the "Cr." side of a Real Account it represents a loss; if the balance falls on the "Dr." side it represents a gain. In both cases the balance is carried to the Profit and Loss Account.

5. The value of goods left at the end of the period, and entered as the final entry, is brought down below the balanced account to the opposite side ("Dr."), with the first date of the new period, and forms the opening of the account for the next year.

Example of a Real Account:—

Dr.			Live Stock Account.						Cr.			
1905.							1905.					
Apr.	1	To Valuation...	268	10	6	Apr.	8	By Sheep sold	120	0	0	
"	6	" Cows bought	80	0	0	"	16	" Cows "	28	0	0	
"	13	" Bull "	20	0	0	"	22	" Pigs "	40	0	0	
"	25	" Sheep "	100	0	0	"	26	" Calf "	0	10	0	
"	1/31	" Feed ...	20	0	0	"	1/31	" Butter "	2	0	0	
"	1/31	" Labor ..	8	0	0	"	31	" Valuation	260	0	0	
"	1/31	" Veterinary	2	2	0			" Balance				
								(loss) ...	48	2	6	
			£	498	12	6			£	498	12	6
May	1	To Valuation	£	260	0	0						

The next article will deal with Personal Accounts, Nominal Accounts, and Balance Sheets.

(To be continued.)

PRELIMINARY REPORT ON SEEDING OPERATIONS AND EXPERIMENTAL WORK IN 1905-1906.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

Early seeding operations having terminated towards the beginning of June, it is now possible to give some brief account of them, together with a general plan of the experimental work that has been undertaken.

GENERAL WEATHER CONDITIONS.

Although in the end, general weather conditions have in this season proved highly favourable to the seeding and early growth of cereal crops, there were times earlier in the year when the question of success or partial failure may have been said to have hung in the balance. In every sense the summer proved abnormal; with the exception of January it was almost rainless. The falls recorded at the College from November 1 to March 31 are appended below:—

November 2	...	...	...	...	0.48	
November 3	...	...	...	...	0.22	
November 4	...	...	...	...	0.17	
					—	0.87
December	...	...	...	...	nil	
January 2	...	...	...	...	0.05	
January 3	...	...	...	...	1.09	
January 4	...	...	...	...	0.10	
January 15	...	...	...	...	0.12	
January 29	...	...	...	...	0.91	
					—	2.27
February 12	...	...	...	...	0.04	
February 23	...	...	...	...	0.09	
					—	0.13
March 4	...	...	...	...	0.08	
					—	0.08
					—	—
Five summer months	...	...	...	...	3.35	

Thus there were practically three rainless months—December, February, and March; and four, if we bear in mind that the November rain, coming early in the month as it did, had almost the effect of an October fall. On the other hand, January was without doubt exceptionally wet. Nevertheless, the intervals of drought, both before and after this month, were so extended in length as to altogether neutralise what advantages might otherwise have accrued from these heavy falls. Summer crops may be said to have failed more or less completely. With these, however, we are not for the present concerned; it is not so with the impress of the drought on the fallows. It was much to our disadvantage that the bulk of the land under bare fallow in such a season should have been poor and

light in character. The difficulties of working such land satisfactorily in dry summers is only too well known to those who have had to handle mallee country. It is practically impossible to avoid overworking, and at the same time keep the fallows clean. The surface soil wears down to a dust-like consistency, and never forms a crust, with the result that all deep-rooted weeds are extremely difficult to eradicate, once they have got a firm hold of the ground. Nor did the January rains help us much in this direction, for the soil, dry and open as it was, appeared capable of absorbing an endless supply of moisture, and the high temperature that accompanied these falls dissipated into the atmosphere with great rapidity what did reach the ground. And, indeed, had it been otherwise, occupied at the time with the press of a heavy harvest, it is doubtful whether we should have been in a position to take full advantage of these late rains. In brief, wherever the land was light the summer condition of the fallows was not satisfactory; in heavy soils, on the other hand, summer tillage was generally of good character.

On the April fall depends much of the success of the season in these districts; and at one time it very much appeared that it would fail us; the April fall is recorded below:—

April 3	...	...	...	...	0.45
April 8	...	...	...	...	0.08
April 10	...	...	...	...	0.07
April 11	...	...	...	...	0.23
April 12	...	...	...	...	0.04
April 24	...	...	...	...	1.10
April 25	...	...	...	...	0.10
April 27	...	...	...	...	0.03

The rains that fell early in the month were insufficient to start seeding operations, particularly after a summer in which the germination of weeds on the fallows had been so meagre. Moreover, whatever may be the advantages of early seeding, it is generally recognised here that early April is just a shade too early for anything but green crops. The fall of the 24th was, however, highly seasonable, and enabled us to proceed with seeding operations under fairly satisfactory conditions. Since then we have registered 2.24 inches in May, and up to June 26 1.53 inches. The weather has generally been mild and favourable to the growth of early crops. Feed, however, is backward and short, mainly owing to the insufficiency of the April fall after an unusually dry summer.

CATCH CROPS.

It would not appear that the value of catch crops is sufficiently recognised here, or more correctly, perhaps, the feeding of live stock has not as yet become sufficiently part and parcel of our farming to render obvious the value of what catch crops can be made to intervene between our main crops. In proportion to the area of land yearly left out of cultivation, the number of live stock kept on the College farm is fairly con-

siderable, and to keep them well supplied with food it becomes necessary to utilise the land available to its full capacity, and in this direction catch crops on the stubbles are always advantageous. They can be put in at very little expense, and return generally far more feed than natural pasture. For this purpose rape is a very general favourite, and rightly so too: it is hardy, responding well to but slight tillage, and grows very satisfactorily in the cold months of the year.

On March 23, about 27 acres of the field known as Ebsary's A were sown with the following mixture:—

Dwarf Essex rape, 10 lb. per acre.

White mustard, $\frac{3}{4}$ lb. per acre.

Crimson clover, $3\frac{1}{2}$ lb. per acre.

About 10 acres of the same field were sown to crimson clover alone at the rate of 10 lb. to the acre. In both cases the seeding was rather heavy, but owing to uncertainty as to weather conditions it was thought better to force the seeding a bit rather than run the risk of thin germination.

A wet April may usually be looked upon as essential to complete success in such crops, and with a wet April we were not favoured this season. Nevertheless, both rape and mustard are making very satisfactory progress, being knee-deep in places. They will be fed down for the first time early in July. Part of the field in which this crop is placed was broken up as fallow with a multi-furrow plough in 1903. Wherever this plough had been used the wheat crop in 1904 was poor and thin when compared with the rest of the field: and curiously enough to-day, in July, 1905, the rape is poor wherever the wheat was poor and strong where the wheat crop was good.

The growth of the crimson clover, though good, is less forward than that of the rape. It is probable that this plant, even more than the rape, is in need of favourable autumn weather to make strong winter growth. Whether or not crimson clover is at all likely to prove a useful catch crop in this district is a question that has yet to be settled. On present appearances, I should be inclined to decide the question in the affirmative. It is, perhaps, a matter for regret that we did not think of testing side by side vetches, for it is possible that the latter crop might succeed where the clover to fail. In any case the advantage of being able to make use of some leguminous crop or other in addition to the reliable rape crop cannot be too strongly emphasised.

ENSILAGE CROP.

As a rule, in the past it has been the practice here to fill the silo pits from the weediest portions of the standing crops, or from rank, spontaneous growth for which no other use could be found. Now, whilst, on the whole, this is a practice that can be recommended as useful and economical, it does not always yield the best of ensilage. Without,

therefore, wishing to discard it altogether, it was determined this year to at least partly fill the pits with a rank crop specially sown for the purpose. In any well-conceived plan of rotation, such a crop could be heavily dressed with farmyard manure, and made to head the rotation. It should be sown as early as possible; would be cut early; and would probably, in normal seasons, give a good second growth, which could be grazed. The land would then be broken up a second time, and made to carry oats or barley.

Twenty acres were set aside for the purpose this season in the field known as No. 7. On April 7 2 cwt. of 36/38 superphosphate to the acre was drilled in; and on April 26 the following mixture was broadcasted and cultivated in:—

Cape oats, 55 lb. per acre.

Galland's Hybrid, 27 lb. per acre.

Early Dun pea, 27 lb. per acre.

Spring vetch, 27 lb. per acre.

At the present moment this crop is looking exceptionally strong and healthy, and it is certain that it will meet satisfactorily the purpose for which it has been sown.

BARLEY CROPS.

Barley crops have been made to occupy this season a far more important position on the farm than has been the case in the past. In support of this policy it may be said that for feeding purposes there is no cheaper cereal that can be grown than barley; and as the number of pigs and other stock fed on the farm is now fairly considerable, we are at all times in need of an abundant supply of cheap grain for feeding purposes. For this purpose barley is in every sense superior to wheat, for where 20 bushels of the latter would be reaped, 40 of barley could generally be depended upon. In addition, notwithstanding local prejudice, barley forms an excellent substitute as horsefeed for oats in the winter months. Then, again, whether it be the two-rowed barleys, or simply Cape barley, that we are dealing with, they always have their price with the maltsters. For instance, this season 2s. 6d. a bushel was offered for a College sample of Cape barley, although no special precautions had been taken in the threshing, and the grain was somewhat damaged.

The main barley crop was sown in the field known as No. 16, and covers 65 acres. Generally speaking, this is a very poor paddock, portion of it consisting of a sand dune, from which the surface soil was completely removed during the summer months; portion of a very shallow layer of light soil resting on limestone rock, with the *débris* of which the soil is now more or less completely covered; and of about 10 acres or thereabouts of fair average soil. This field was fallowed last winter and sown to pie-melons and pumpkins in the spring. The pumpkins failed almost completely, whilst the pie-melons succeeded only on the sandy patches. In extenuation of this failure it should be noted that spring

and summer could not have been more unfavourable to these crops. In this field the character of the land to which reference has already been made, the comparatively rainless season, together with the awkward crops which it carried, rendered summer tillage exceedingly difficult, and it proved practically impossible to keep strong growing weeds in check. Nevertheless, it would be difficult to-day to find a cleaner or stronger growing crop than the barley that was sown there from April 26 to May 2, the only weak portion in the field being the sandhill, from which the surface soil was removed by summer storms.

Ordinary Cape barley was sown in this field, at the rate of 110 lb. to the acre. It was drilled in with 2 cwt. of 36/38 superphosphate.

Field known as No 9, 20 acres in area, is also under barley. This is also, in its natural conditions, a poor paddock, consisting mainly of a light, shallow soil of limestone formation. In its present condition, however, it offers an excellent example of the great advantages that may be derived from feeding stock on land of this character. For six years, I believe, this field was used as a pig paddock. It was broken up late last year and sown to sorghums and millets. The latter, like all our summer crops, failed partially. The barley was drilled in from May 3 to 6 with 1 cwt. of 36/38 superphosphate, and is now a real picture of luxuriant growth; in fact, it is more than likely that portion of it at all events will have to be used as green feed.

In this field have been sown various French barleys, specially imported for purposes of comparison with our local grain. Several have the reputation of being first-class malting barleys, and it is hoped that some at least will prove suited to local conditions. All are looking exceptionally well just at present; but it is, of course, too early as yet to form any definite conclusion as to their ultimate value. I shall, therefore, merely enumerate them for purposes of reference:—

	Acre.
Winter Square (imported)	1
Spring Square (imported)	1
Black Six-rowed (imported)	1
Guymalaye (imported)	1
French Chevalier (imported)	1
Richardson (imported)	1
Hallett's Pedigree (imported)	1
Chevalier (local seed)	5½
Duckbill (local seed)	3½
Cape (local seed)	4

In addition to the above three twelfth-of-an-acre plots of imported barleys have been sown in Field No 7. These are:—

1. Albert.
2. Princess of Swaloff.
3. Skinless Nepaul.

Messrs. Barrett Brothers, of Kent Town, have also supplied us with two samples of what they consider first-class malting barley; these have been sown in Field No. 3, and are "Premier" and "Prolific." These last varieties, which were drilled in with 2 cwt. of 36/38 superphosphate, on May 16, cover each half an acre in area.

OATS.

We have never found oats a very reliable crop on the College Farm, and, particularly as it was principally light lands that came into cultivation this year, it was decided not to put in too extensive an area of this cereal. The field known as Dahlitz, about 40 acres in area, is at present under Calcutta oats, the variety that has usually in the past succeeded best with us; 1 cwt. of 36/38 superphosphate to the acre was drilled in before the rain, and 100 lb. of oats were broadcasted, and covered from April 27 to 29.

This is a paddock of average quality, the soil being generally somewhat light in texture. It was fallowed in winter, and half sown to pease in July, which may be said to have been tolerably successful; whilst the balance was put under maize, which went the way of all our summer crops. The oat crop, as is generally the case in early winter, is somewhat backward; but as this paddock is fairly clean, there is little fear of any failure here.

WHEAT CROPS.

The main wheat crop was sown in the field known as Flett's. This is the second crop that this paddock has carried since purchased for the College in 1902. It is essentially a poor paddock, and somewhat fouled with weeds. As we have not yet been in a position to fence it properly, it has not come under the improving influence of grazing. In any case, as it has been manured only once before, the natural herbage is exceedingly scanty and poor in quality. The soil on this field is mostly very light in texture, and we experienced considerable difficulty in keeping it clean without overworking it during the course of last summer. It is not likely that this crop will be quite as clean as might have been desired.

As this field has been dressed with superphosphate only once before, and that in 1903, it has been decided to reserve a narrow strip through the field permanently unmanured, so that the striking effect of phosphatic manures will be discernible in both future crops and natural herbage. At the present moment the difference between the unmanured strip and the adjoining crop is very apparent.

Two hundredweight of 36/38 superphosphate to the acre was drilled in ahead of the seed from March 18 to April 7. The seed was broadcasted and covered from May 1 to 13; 80 acres to Gluyas and 80 acres to King's Early. The seed was pickled with bluestone, and sown at the rate of 100 lb. to the acre. Unfortunately, a narrow strip nearest to the main

road was accidentally over-pickled, and as germination was very bad it was scarified up and re-sown in June with Carmichael's Eclipse.

VARIETIES OF WHEAT.

Various varieties of European wheats were imported from France for purposes of comparison. They were placed next to the ensilage crop, in Field No. 7. They were drilled in with 1 cwt. of 36/38 superphosphate to the acre, from May 15 to 20. The following are the varieties in question:—

	Acres.
Richelle de Naples	1 $\frac{1}{4}$
Noé	1 $\frac{1}{2}$
Touzelle de Provence	1 $\frac{1}{2}$
Petanielle Blanche	1 $\frac{1}{2}$
Belotourka	1 $\frac{1}{2}$
Medeah	1 $\frac{1}{2}$

I might point out in this connection that the flinty wheat that used to be grown here some years past under the name of Medeah was in all probability not the real Algerian Medeah. It will, therefore, be interesting to compare it with this undoubtedly genuine sample.

In addition to the above one-twelfth-acre plots of the following varieties have also been sown:—

Large Foliage Cape Wheat
 Beardless Odessa
 Red Egyptian
 Bearded Spanish Red
 Black Petanielle of Nice
 Bearded Rieti
 Polish Wheat
 Starch Wheat
 Common Beardless White Spelt
 Bearded Black Spelt.

These varieties, which were all imported from France, are sown in the same field as the preceding ones.

In addition to the above, the following varieties that had yielded fairly well with us have been sown in temporarily vacant plots of the experimental Field No. 4:—

Rerraf
 Carmichael's Eclipse
 Jonathan
 Comeback

In each case 70 lb. of seed were drilled in with 1 cwt. of 36/38 superphosphate to the acre.

VARIETIES OF OATS.

Side by side with the varieties of wheat in Field No. 7 were sown, from May 21 to 22, several varieties of oats imported from France for

purposes of comparison. These oats were drilled in at the rate of 100 lb. of seed to the acre, with 1 cwt. of 36/38 superphosphate. The following are the varieties sown:—

	Acres.
Winter Dun Oat	1 $\frac{1}{4}$
Yellow Giant	1 $\frac{3}{8}$
Black Etampes	1 $\frac{3}{8}$
Black Brie	1
Ligowo	1 $\frac{1}{4}$
Red Crowned	1
Poland Oats	1

The following imported oats were also sown in small one-twelfth-of-an-acre plots in the same field:—

Black Mesdag
 Black Hungarian
 Joannette
 Californian Prolific
 White Hungarian
 Large Skinless.

HAND PLOTS.

In addition to the above, several hand plots of the various cereals have been sown, the mere names of which would be of but little general interest. Some of them have been undertaken with the object of improving varieties already in cultivation by careful selection. Some account of them will be given from time to time as occasion arises.

RYE.

With a view to securing some good thatching straw, six acres of rye were sown on June 6, in Field No. 16. The seed was drilled in with 2 cwt. of 36/38 superphosphate to the acre.

HAY CROPS.

Whilst we readily recognise that in this district it is generally good policy to sow early crops that are intended for hay, we were for a variety of reasons unable this season to give effect to it, and we shall therefore have to look upon most of our hay crops as late crops.

The first crop was placed at the top end of experimental Field No. 4. About 20 acres were here sown to Calcutta oats on May 14 and 15. One hundred pounds to the acre were drilled in with 1 cwt. of 36/38 superphosphate.

Subsequently, on May 16 and 19, 18 $\frac{1}{2}$ acres in Field No. 3 were sown to a mixture of wheat and oats, and similarly manured. We used 60 lb. of Majestic and 50 lb. Calcutta oats to the acre. At this stage heavy rains intervened, and the balance of the field was not sown until June 8 and 9. This consisted of 12 acres of King's Early and 5 acres of Marshall's No. 3, drilled in with 2 cwt. of 36/38 superphosphate.

EXPERIMENTAL FIELD.

Field No. 4. has been permanently set aside for experimental purposes. It has been cut up into 61 two-acre plots, which, on the Rothamsted model, will be kept permanently under similar conditions of manuring and general cultivation. It is hoped that in the course of time a careful study of the results secured in this field will prove the means of solving many problems of interest to South Australian agriculture.

The experimental work is spread over several series, each of which will now be considered separately:—

A—ROTATION SERIES.

This series comprises Plots 2 to 13 inclusively. It is not in any way connected with ordinary manure experiments, but has been arranged with a view to comparing the money returns from land worked on different lines of rotation. Of course, the cost of manures used and general treatment will in each case be taken into consideration, as it is the net return that mainly concerns us, and not the gross return.

Plots 2 to 5.—These four plots, which cover 8 acres, will serve to illustrate an ordinary four-course rotation. During the present season they are arranged as follows:—

Plot 2—Kale; 14 tons farmyard manure.

Plot 3—Barley; 1 cwt. superphosphate.

Plot 4—Pease; 1 cwt. superphosphate.

Plot 5—Wheat; 1 cwt. superphosphate.

Next season Plot 2 would be under barley, Plot 3 under pease, Plot 4 under wheat, and Plot 5 under kale; and so on from year to year.

Plots 6 to 9.—These four plots illustrate another four-course rotation. They are arranged as follows in the present season:—

Plot 6—Mangels; 14 tons farmyard manure.

Plot 7—Oats; 1 cwt. superphosphate.

Plot 8—Pease; 1 cwt. superphosphate.

Plot 9—Wheat; 1 cwt. superphosphate.

Plots 10 and 11.—This is the ordinary local rotation, and is arranged as follows for the present season:—

Plot 10—Bare fallow.

Plot 11—Wheat; 1 cwt. superphosphate.

Plots 12 and 13.—A variation of the preceding rotation, whereby a summer crop has been made to cover the bare fallow. It has been arranged as follows for the present season:—

Plot 12—Sorghum; 1 cwt. bonedust.

Plot 13—Wheat; 1 cwt. superphosphate.

B—COMBINED ROTATION SERIES TO TEST RESIDUAL VALUE OF VARYING DRESSINGS OF PHOSPHATES ON NATURAL HERBAGE.

This series comprises Plots 14 to 25 inclusively. Results obtained here may, of course, be compared with those obtained in the preceding

series, as illustrating a local three-course rotation, viz.:—1, bare fallow; 2, wheat; 3, grazing. In addition to this it will, in the course of time, serve to measure the effect of light or heavy dressings of superphosphates on the natural herbage that follows the wheat. The following is the arrangement adopted this year:—

Plots 14 to 16.—

Plot 14—Natural herbage.

Plot 15—Bare fallow.

Plot 16—Wheat; $\frac{1}{2}$ cwt. superphosphate per acre.

Plots 17 to 19.—

Plot 17—Natural herbage.

Plot 18—Bare fallow.

Plot 19—Wheat; 1 cwt superphosphate to the acre.

Plots 20 to 22.—

Plot 20—Natural herbage.

Plot 21—Bare fallow.

Plot 22—Wheat; 2 cwt. superphosphate to the acre.

Plots 23 to 25.—

Plot 23—Natural herbage.

Plot 24—Bare fallow.

Plot 25—Wheat; 3 cwt. superphosphate to the acre.

C—SERIES TO TEST VALUE OF NITRATE OF SODA AFTER BARE FALLOW.

This series comprises Plots 26 to 33 inclusively. It has been drawn up with a view to elucidating whether nitrate of soda is of any value to cereal crops sown after bare fallow; and if so, at what time of the year the dressing is likely to prove most effective under our conditions, whether when applied at the same time as the seed, or whether as a top dressing in spring. Associated with this series are two no-manure plots, which can be used for purposes of comparison in the other series as well. The arrangement adopted this year is given below:—

Plots 26 and 27.—

Plot 26—Bare fallow.

Plot 27—Wheat; permanently unmanured.

Plots 28 and 29.—

Plot 28—Bare fallow.

Plot 29—Wheat; 2 cwt. superphosphate per acre.

Plots 30 and 31.—

Plot 30—Bare fallow.

Plot 31—Wheat; 2 cwt. superphosphate per acre, 1 cwt. nitrate of soda broadcasted at seeding time.

Plots 32 and 33.—

Plot 32—Bare fallow.

Plot 33—Wheat; 2 cwt. superphosphate to the acre, 1 cwt. nitrate of soda broadcasted in spring.

D—SERIES OF CONTINUOUSLY-GROWN WHEAT CROPS, VARIOUSLY MANURED.

This series comprises Plots 34 to 40 inclusively. The plots will continue year after year under wheat, receiving each year the same dressings of manure. The general plan is shown below :—

Plot 34—Wheat ; 2 cwt. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda.

Plot 35—Wheat ; 2 cwt. superphosphate, 1 cwt. nitrate of soda.

Plot 36—Wheat ; 2 cwt. superphosphate, $\frac{1}{2}$ cwt. sulphate of potash.

Plot 37—Wheat ; 2 cwt. superphosphate, 1 cwt. sulphate of potash.

Plot 38—Wheat ; 2 cwt. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda, $\frac{1}{2}$ cwt. of sulphate of potash.

Plot 39—Wheat ; 2 cwt. superphosphate, 1 cwt. nitrate of soda, 1 cwt. of sulphate of potash.

Plot 40—Wheat : permanently unmanured.

It will be noticed that in all the above plots, with the exception of the unmanured Plot 40, a uniform dressing of 2 cwt. of superphosphate to the acre has been given. The absolute necessity of this manure here for the growth of good cereal crops has been in the past so abundantly proved as to be now beyond the need of any further demonstration.

E—SERIES FOR ILLUSTRATING THE ACTION OF VARIOUS FORMS OF PHOSPHATIC MANURES.

This series comprises Plots 41 to 61 inclusively. In it are to be tested various forms of phosphatic manures against unmanured plots and plots dressed with farmyard manure. In every instance the wheat crop will be preceded by bare fallow. The general arrangement of the plots is shown below :—

Plots 41 and 42.—

Plot 41—Bare fallow ; 14 tons farmyard manure.

Plot 42—Wheat ; no manure.

Plots 43 and 44.—

Plot 43—Bare fallow ; 4 cwt. raw rock phosphate.

Plot 44—Wheat ; no manure.

Plots 45 and 46.—

Plot 45—Bare fallow.

Plot 46—Wheat ; 4 cwt. raw rock phosphate.

Plots 47 and 48.—

Plot 47—Bare fallow ; 2 cwt. Thomas phosphate.

Plot 48—Wheat ; no manure.

Plot 49.—

Plot 49—Wheat ; 1 cwt. superphosphate, 5 cwt. lime.

Plots 50 and 51.—

Plot 50—Bare fallow.

Plot 51—Wheat ; 2 cwt. Thomas phosphate.

Plots 52 and 53.—

Plot 52—Bare fallow.

Plot 53—Wheat; no manure.

Plots 54 and 55.—

Plot 54—Bare fallow.

Plot 55—Wheat; $\frac{1}{2}$ cwt. superphosphate.*Plots 56 and 57.—*

Plot 56—Bare fallow.

Plot 57—Wheat; 1 cwt. superphosphate.

Plots 58 and 59.—

Plot 58—Bare fallow.

Plot 59—Wheat; 2 cwt. superphosphate.

Plots 60 and 61.—

Plot 60—Bare fallow.

Plot 61—Wheat; 3 cwt. superphosphate.

It will be noted that an endeavour has been made to ascertain whether the less soluble phosphatic manures, raw rock phosphate and Thomas phosphate, will yield more satisfactory results if applied on the fallows instead of being drilled in with the seed. These manures, in Plots 43 and 47, would be drilled in on the fallows as soon as the latter had been worked down by the cultivators. The series closes with a fairly exhaustive test of the dressings of superphosphate that can with any advantage be drilled in with the seed. Plots 54 to 61 inclusively can, of course, be taken as terms of comparison for the manure plots of other series.

In all the plots, wherever wheat has been sown this year, Gluyas is the variety that has been used. Preference has been given to this variety because of its reliability here and complete resistance to rust. The seed has been pickled throughout with a 2 per cent. solution of bluestone. The cereals were drilled in between May 13 and 25.

EXPERIMENTAL MANURING OF HAY CROPS.

The following plots were established in No. 3, in duplicate of similar experiments that Professor Angus has undertaken in other parts of the State. Each plot is one acre in area, and is sown with 50 lb. of Calcutta oats and 60 lb. of Silver King wheat. Plots 1 to 4 inclusively were sown on May 26, and the balance after the rain on June 7. Details of the experiments are appended below:—

Plot 1—168 lb. mineral superphosphate.

Plot 2—112 lb. mineral superphosphate.

Plot 3—112 lb. mineral superphosphate, 56 lb. ammonium sulphate, 68 lb. sulphate of potash.

Plot 4—112 lb. mineral superphosphate, 56 lb. ammonium sulphate, 56 lb. muriate of potash.

Plot 5—112 lb. mineral superphosphate, 70 lb. nitrate of soda, 68 lb. sulphate of potash.

Plot 6—112 lb. mineral superphosphate, 70 lb. nitrate of soda, 56 lb. muriate of potash.

Plot 7—168 lb. mineral superphosphate, 70 lb. nitrate of soda, 68 lb. sulphate of potash.

Plot 8—No manure.

Plot 9—112 lb. mineral superphosphate, 70 lb. nitrate of soda.

Plot 10—112 lb. mineral superphosphate, 68 lb. sulphate of potash.

Plot 11—70 lb. nitrate of soda, 68 lb. sulphate of potash.

CONCLUSION.

In conclusion, it may be stated that the prospects of the crops hitherto sown are distinctly satisfactory. Large areas will be shortly put under pease, kale, and other crops, details of which will be available from time to time. We intend as rapidly as circumstances permit to change the farm from a more or less exclusively wheat-growing area into one on which mixed farming, suited to the district, will be practised. This means, of course, that the greater portion of the cash receipts will be derived from the sale of animal produce. And, as it is towards this goal that South Australian farming, within the good rainfall area, must ultimately turn, we hope that, as in the past, useful practical hints may be drawn from Roseworthy results.

AUSTRALIAN HORSE TRADE.

The following is a copy of a letter addressed to the Hon. the Prime Minister by Colonel Good, Director-General of the Indian Army Remount Department:—

“The Government of India, through the Director-General of Remounts, takes from 2,000 to 3,000 horses annually for army purposes (last year 4,000), at £45 per head, landed and approved in India. The horses brought over for this purpose are nearly all unbroken. These horses are mainly horse and field artillery class, with more or less cavalry from time to time. These artillery classes are the pick of the horses of that type bred in Australia, and unfortunately the class is decreasing rapidly.

“I would not have bothered you with this subject were the matter not entering into an acute stage, but horses of the class required are now so scarce that they realise prices at which our shippers will not be able to continue the trade, and I have this season had to import horses for army purposes from North America, Argentina, and Hungary in order to see how these horses do in India, and thus be able to turn elsewhere at once for remounts should Australia fail us. It would be a matter of the deepest regret should I have to do so, for as we stand I believe that no other army in the world is horsed as well as His Majesty's army in India is

with our Australian horses, and I sincerely trust that the supply may continue. I have talked the matter over with Mr. Campbell (Director of Agriculture for New South Wales), and with the Hon. Mr. Swinbourne (Minister for Agriculture in Victoria), and they both agree that some step should be taken immediately to mend matters. I trust, however, that the subject may receive your assistance, for whatever is done should be done quickly, or the trade will be lost to Australia.

"As regards the decrease of the class of horse we require, this is in no way owing to the purchases of horses made for South Africa, Germany, and Japan, as these horses were of a very different standard; so much so that when the War Office proposed, when returning British cavalry regiments to India (sent from India to South Africa ready horsed), to send with them the horses on which during the process of time they had been remounted in South Africa, this offer was, on my representation as to the inferior class of horse we should receive, refused by the Indian Government. In addition to the Government trade, large numbers of superior horses are annually shipped from Australia for the private market in India.

"The difficulty now experienced in obtaining the class of horse we require for the army in India is, I believe (and I have made very careful enquiry into the matter), mainly due to the facts:—

"1. That many inferior stallions are being used.

"2. That owners have sold many of their best mares for export.

"The remedy, if I may be allowed to offer an opinion, is:—

"1. A tax on all stallions, none being allowed to cover unless passed by a duly qualified official appointed to inspect them.

"2. In Government providing really good stallions—thoroughbreds, Clydesdales, Suffolks, and Welsh ponies—for use by breeders at a nominal fee. This system obtains in all the great horse-breeding countries in Europe. I personally have had the advantage of visiting these countries for the Government of India and studying the systems in force. Or—

"3. In giving premiums to private individuals (as is done on a very small scale in England), who will stand approved stallions at a nominal fee for the use of breeders.

"4. Steps should be taken to prevent the best mares leaving the country.

"As regards 2 and 3. it may be thought that 2 might interfere with private enterprise. Should this be so, then 3 would meet the case, should sufficient private owners be willing to take the matter up, on the local Government calling for offers to do so; but I would strongly urge that whatever is done be done without delay. It must also be remembered that in either case the whole success of the matter depends on thoroughly suitable men being chosen to approve or buy stallions; and stallion keepers should have sufficient experience to advise small breeders who own two or three mares which class of stallion to put to their mares.

"Australia has a record second to no country in the world for breeding good horses of every class, and the trade with India in such horses brings a certain amount of money into the country (mainly to Victoria, New South Wales, and Queensland), for remount alone this season £180,000 (£45 × 4,000) having been paid by my department for Australian horses. In addition to this it must be remembered that a large amount of money, labour, etc., is employed for forage, grain, shipping, etc., for the large number of horses now exported from Australia, and it would be a million pities that this should go elsewhere."

ARE THE PIPS OF FRUITS ESSENTIAL TO THE PERPETUATION OF THE CODLIN MOTH?

In a recent issue of the daily press, Mr. George Monks, of Forest Range, takes the Editor of *The Journal of Agriculture* to task for assuming a neutral position in a discussion upon the above subject. Mr. Monks challenges the Editor "to produce a codlin moth from a codlin moth caterpillar that has not eaten some portion of the pips of an apple, a pear, or a quince." In support of this he sets forth his experiences and observations made over a number of years in the hills near Adelaide. These certainly do not prove the Editor's position to be untenable, for whilst general but essentially disconnected observations of such a nature as those outlined by Mr. Monks may lend colour to a theory, they provide no data upon which a scientific fact may be established.

Mr. Quinn—who supplied the information from which the Editor's note was an abbreviation—has made many experiments in connection with the hatching and development of this insect, and he also states that when on a few occasions larvæ were taken from stone fruits they failed to reach the moth stage. He states, however, that the infested plums, nectarines, and peaches rotted so rapidly that the suspected larvæ of codlin moth had not time to feed up to full growth before their host fruits became a collapsed and liquid mass of decomposed matter. Mr. Quinn would not, in the light of his tests, declare the impossibility of the codlin moth perpetuating its species when fed upon the pulp of stone fruits, but considers it improbable that such an event would occur with sufficient frequency to make it worth while for the orchardists to take steps to treat the stone fruit trees.

The suspicion that codlin moths may be developed from stone fruits is certainly supported from outside experience. In the fourth biennial report of the State Board of Horticulture of the State of California, issued in 1894, on page 85, Mr. Alexander Craw, the entomologist to that body, reported as follows:—"In Alameda County I found some larvæ infesting ripe cherries, that, when bred, proved to be the codlin moth (*Carpocapsa pomonella*). This, I think, is a new food for this pest, but they were not found in any great numbers." If Mr. Craw's statements be true, Mr.

Monks' challenge to produce a moth developed without pip food could be gratified, no doubt, from South Australian sources.

While interesting from a scientific point of view, the proving of this matter would probably possess little of a practical value. Whether codlin moths raised from larvæ found in stone fruits would be capable of continuing the propagation of the species certainly is another matter, and one which would be fraught with considerable economic interest if the absolute extermination of the pest were deemed practicable.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, June 14. Present—Colonel Rowell (chair), Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, A. M. Dawkins, J. Miller, B. Basedow, R. Caldwell, G. F. Cleland, and R. Marshall.

The Secretary for Agriculture intimated that four 30-lb. tins of good quality honey were to be forwarded to the Agent-General, with request that the honey be put up in attractive glasses and submitted to the trade in London to ascertain views as to the quality and value of the different samples.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. J. Good, R. Butler, jun., A. V. Nairn, B. Franks, M. Farrelly, F. Jenkins, and L. Wilson, Mallala; H. Darwin, Redhill; H. Graham, A. Wilson, C. Kerr, G. Ferguson, H. Royal, E. Hewett, L. Batten, E. A. McDonald, and C. Williams, Caltowie; R. McClenaghan, W. Thyer, F. W. Kilsby, J. R. McPhee, and R. Fowler, Penola; T. Avery and H. Brown, Morchard; J. Reynolds, Lyndoch; H. Nancarrow, Crystal Brook; G. F. Jenkins, T. Hams, H. O. Scott, and A. E. Green, Whyte-Yarcowie; George McEwin and J. Hutchens, Golden Grove; F. C. Fischer, Bowhill; E. W. Smart, Dawson; George Ashby, Port Germein; A. Thorne and K. Shannon, Angaston; J. McDonald, F. C. Chapman, and F. Treloar, Burra; A. J. Attiwill, J. P. Spry, and W. Butler, Naracoorte; V. W. Day and T. W. Bahn, Reeves Plains; H. Beckman, P. Connors, C. T. Rose, H. Ward, J. O'Grady, F. W. Haëusler, C. Rowe, K. Walkington, W. H. Combe, and J. Ryan, Wilson; J. J. Sheedy, A. Taylor, J. Curnow, H. Huxtable, and W. Clarke, Virginia; W. H. Brown, W. Roberts, J. Miller, and J. C. Suggants, Bagster.

Mr. Sandford explained terms of new contract with the mail companies for carriage of butter to Europe. The new contract was very favourable to shippers, and represented a considerable saving in freights.

Mr. Caldwell asked whether the Chairman was in possession of any report on dry bible from Veterinary Surgeon Desmond. The Chairman replied in the negative. Mr. Caldwell said it seemed to him that Mr.

Desmond was simply rushed from place to place without any chance of making a definite investigation. This was a very serious matter, but they were in no better position than they were twelve months ago. Mr. Caldwell moved:—"That the Government be requested to place Mr. Desmond in a position to furnish a progress report at earliest possible opportunity." Mr. Marshall seconded, and said he was satisfied dry food was not the only cause of the trouble. They had lost heavily from time to time, but their cattle were never without succulent food—ensilage, sorghum, etc., in the summer—for any length of time, and then they received good chaff, bran, etc. He believed the losses during the past year had been as great as in any previous year. The Secretary of Agriculture intimated through the Chairman that the Hon. Minister had that day decided that for the next two or three months Mr. Desmond's services should be devoted almost entirely to the enquiry into this complaint.

Mr. Marshall called attention to newspaper report that the Californian Horticultural Department had offered to introduce and establish the recently discovered codlin moth parasite into each State for £1,000, which amount would only be paid if the parasite proved effective. The Secretary said he knew of no official confirmation of the alleged offer. On motion of Mr. Caldwell it was decided that the Government be asked to communicate with the Californian Department in reference to the value of the codlin moth parasite, and whether the offer referred to would be made.

In reply to Mr. Sandford, the Secretary stated that the importation of potatoes from New Zealand was prohibited on account of the existence of the potato blight in New Zealand.

On motion of Mr. Caldwell a hearty vote of thanks was accorded to Colonel Rowell for his services as Chairman. Colonel Rowell responded, and thanked the members for their good wishes.

"JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,
Adelaide.

AGRICULTURAL BUREAU CONFERENCE.**SADDLEWORTH, JUNE 22-23.**

A Conference of the Mid-Northern Branches of the Agricultural Bureau, arranged by the Saddleworth Branch, was held at that centre on June 22 and 23. The following members of the Agricultural Bureau were present:—Messrs. J. H. Frost, W. H. Blee, W. T. Frost, W. Hannaford, F. Plant, A. Klem, W. E. Leeder, L. Baldwin, F. Coleman, H. H. Klau, H. Eckermann, J. H. Eckermann, and J. Scales, Saddleworth; Messrs. R. Cooper, I. Longbottom, N. Malcolm, and A. J. Davis, River-ton; Messrs. R. Olliver, W. Day, W. H. George, and J. G. Folland, Reeves Plains; Messrs. A. H. Marshman, F. M. Worden, and J. Nairn, Mallala; Mr. J. G. Williams, Watervale; Messrs. H. N. Tuck and Robinson, Balaklava; Messrs. J. J. O'Sullivan, A. W. R. Vogt, J. P. Daley, and B. R. Banyer, Kapunda. Messrs. W. Angus (Secretary for Agriculture), George Quinn (Horticultural Instructor), George Jeffrey (Wool Instructor), J. Desmond (Veterinary Surgeon), P. H. Suter (Dairy Instructor), and D. F. Laurie (Poultry Expert) attended from the Department of Agriculture, and Mr. A. Molineux represented the Council of Agriculture. A considerable number of visitors were also present.

Mr. J. H. Frost (Chairman of the Saddleworth Branch) presided, and, in a short address, welcomed the visitors, and explained the purpose of the Conference, which was mainly to afford farmers an opportunity of hearing the expert officers attached to the Department of Agriculture.

A resolution expressing sympathy with Mr. R. Marshall in his recent sad bereavement was carried.

LAMBS AND WOOL.

Mr. George Jeffrey gave an address on this subject, dealing with the breeding of fat lambs and the treatment of wool. Fat lamb raising was to his mind the most profitable branch of the sheep industry where such work could be carried on. In this connection he advised local farmers not to breed, but buy their ewes. The ram he advocated was one of the early-maturing breeds, for preference the Shropshire, but he was aware of the satisfactory results that had followed the use of the Dorset-Horn. In speaking of Merino sheep, the lecturer said the big frame, robust, and bold wool type was the most profitable. Farmers should pay attention to a careful and systematic packing of their clips of wool. Mr. Jeffrey deprecated the over-classing of wool, and laid down in detail simple methods whereby farmers might secure the best results. Although he did not represent the woolbrokers he would advise sheepowners to allow the firms to whom they sent their wool to sell it without any humbugging with reserves. Samples of Bradford tops and noils were exhibited by the lecturer, and much interest was taken in them.

Mr. Williams said he was called away from his farm recently for about three weeks, and when he returned he found that he had lost a large percentage of his ewes, which had been attacked by the blow-fly. He saved the rest by placing them in a race and spraying them with Cooper's dip on the parts where the fly usually attacked the animals, with satisfactory results. The loss afterwards was only a fraction of 1 per cent. Mr. Jeffrey agreed with this treatment. In reply to questions, he advised small growers not to mark the bales with the quality of the wool, simply describe it, and leave the buyers to judge the quality for themselves. Ewes affected by "devil's grip" should be culled out of the breeding flocks, as the complaint was readily transmitted to their progeny.

THE POULTRY INDUSTRY.

Mr. D. F. Laurie spoke on "Poultry." He mentioned that the industry had great possibilities, and drew attention to the fact that the export trade last year represented a value of £116,000. No other industry in the country was more suitable for womenfolk. The egg-laying competitions that had been held in South Australia lately had shown that poultry could be profitably kept for the production of eggs. Years ago some of the Asiatic breeds, such as the Cochins, were in favour in South Australia for a time, but when it was found that they did not produce as many eggs as some of the other varieties they fell into disfavour. If farmers wanted good laying fowls they should obtain them by breeding only from the best layers in their possession. The trap nest was the means of deciding which were the best hens. Americans had greatly improved their breeds of poultry from a utility point of view by breeding from selected hens. If the number of eggs laid by the present number of birds in South Australia were increased to the extent of five eggs per hen it would mean an addition to the value of the export trade of £5,000 per annum: and if the number were increased 20 eggs per hen the rise in value would be £20,000. There should be better organisation amongst farmers in the marketing of the eggs. The Branches of the Agricultural Bureau should consider the advisableness of forming small committees to deal with poultry matters, and induce the farmers not to glut the market at certain seasons with their eggs. There was a great need of a better regulation of the supplies placed upon the market; otherwise they would be playing into the hands of the dealers. Intending purchasers of fowls were advised to be very careful from whom they purchased them. Enquiries should be made about the parent stock, because it was very important that the birds they purchased should have been bred from sound birds. He would not advise them to take up poultry breeding on an extensive scale, but his endeavour was to induce people to keep a better class of birds generally. Americans had very large poultry farms; but residents of South Australia should not forget that breeders there had large markets close at hand to work upon. New Zealand and New South Wales did an export trade in poultry with England,

and why should not South Australia do the same? A number of questions were answered, and the following points elicited:—The breeding stock should not receive forcing feed. The best crosses for table purpose were Old English Game and Dorking, Indian Game and Dorking, and Indian Game and Orpington. As a general utility breed the Wyandottes—all colours—were excellent. In feeding, wheat alone was too concentrated; it would be found advantageous to roast some occasionally until it was the colour of coffee. Green bone or bonemeal and separator milk were valuable in egg production. Green feed was of great importance. Mr. Folland advised boxthorn hedges for shelter and also for green feed. Jersey kale and sugar beet were easily grown for autumn green feed.

AGRICULTURE AND STOCK.

Professor Angus delivered an instructive lecture on "Agriculture." He said that as there were one hundred Bureau centres in existence, it was impossible for him to visit more than a few each season. The organisation of the Department of Agriculture and the widening of its influence and usefulness had been a sufficiently good reason for his devoting so much time to it. The main objects of the Conference were to exchange views and experiences on matters of import to those engaged in rural industries in that part of the State; to receive suggestions from outsiders as to how their methods of farming might be extended and improved; to foster that spirit of brotherhood and good feeling so essential among those who were working with similar aims and among whom union and co-operation were so desirable; to inform those who were representing the Department of Agriculture how they could help them in their farm practice; and lastly, for each delegate to carry back to his Bureau a personal report of what had been done. He was pleased to see that Mr. Molineux—the pioneer of the Agricultural Bureau—was present that day. He would confine his remarks principally to wheat and lambs, which formed the main products of the district. In growing wheat it was always safe to grow the best. Wheatgrowers should consider the market to which their grain was shipped. What did that market require? His answer was (1) a good-coloured, sound wheat, that handled well; (2) a strong wheat for mixing; (3) a good milling wheat; (4) a well-graded wheat; (5) a sufficient quantity of well-graded wheat to make it worth while for the buyer to regard it as a special line. Lately farmers had reasonably complained that no encouragement had been given them to grade and sell heavy-weight wheats; but if they persevered they would win in the end. Departmental experiments with different varieties of wheat had been undertaken with a view to encourage the growing of a sufficient quantity of a good, uniform sample. If farmers were careful to grow grain of this description he was convinced their reputations as producers of wheat would be greatly enhanced, while the returns would amply justify the extra care necessitated. They had almost unlimited power in wheat production. There

were a few points on lamb production to which he would refer. Professor Lowrie, now of New Zealand, had said recently that the conditions for the production of lambs in South Australia were not equalled in any other part of Australasia. As an outsider, he (Professor Angus) knew there was a growing popularity for Australian lambs in Great Britain. At first Australian lamb was the poor man's fare; now it was every man's food. John Bull would not pay 9½d. per lb. for English lamb or 8d. per lb. for English mutton when he could get the Australian article, probably as good, at from 4½d. to 6d. per lb. Prices of lamb were kept down in London through lack of care in export. The great complaint was want of grading and uniformity of consignment. A better selection of rams would overcome this difficulty. Mr. Jeffrey agreed with him as to the class of ram to use. For crossing purposes for London nothing could equal the Shropshire-Merino cross. In the North of Scotland, where there was every choice of lamb for the butcher, nothing took his eye like the cross Shropshire lamb, and the same held good in London. When the lambs were cut and hung in London the differences appeared. The roughness and want of quality in a Suffolk cross and the bigger, coarser bone of a Hampshire cross were very noticeable when they were put among lambs of better quality, and this trade was one above all others where quality and uniformity of sample were absolutely necessary. Another aspect of this promising industry was the matter of feed. In a season like the present there was no reason why ewes should not be on splendid feed early in April. When threshing operations were over the surface of the land should be broken with the cultivator, and a variety crop sown to come up in from six to ten weeks' time to provide plentiful feed for milk ewes. Rape, mustard, white mustard, rye, barley, wheat, chicory, peas, beans, and lucerne would do well. They should be put down at different times during the year, and would then afford feed at different periods during the summer and autumn. The provision of such food would have a splendid effect on the lambs. The growing of thousand-headed kale and of mangels should be a feature of the district. He was sure they could be cultivated with profit. Nothing was better for ewes for summer feed than matured mangels. He was certain South Australians had only touched the fringe of this industry, and he hoped it would receive more consideration. To improve their flocks meant making them more profitable. Touching on horse-breeding, he said that with prices as they had been for the last six months it was time farmers saw the force of having a few horses put on the market every year. The prices for good farm horses, heavy draughts and fillies from good stock, made one's mouth water at the present time. To see two heavy five-year-olds from the Middle North bring close on £90 showed how scarce good animals were. The type of animal to get was not the lean, long-legged-Clydesdale they heard of at Port Pirie recently, but the sound-legged, good-constituted, well-built horse. To breed from unsound or mongrel ani-

mals only courted ruin. Professor Angus gave a half-hour's lantern lecture, in which he showed some specimens of famous British stock.

THE FARMER'S ORCHARD AND GARDEN.

Mr George Quinn (Horticultural Instructor) gave a highly interesting chat on "The Farmer's Orchard and Garden." He said farmers had not taken greatly to gardening. The first race of farmers were not generally imbued with an idea of cultivating gardens. Their inclination was to make as much as possible, then leave the farm and migrate to the city or other more congenial part. With later years that inclination had disappeared to a great extent, and the farmer settled in his homestead and made it his home, probably with the intention of handing it down to his children. Had farmers been trained in horticulture they would not have experienced such trying times prior to the advent of fertilisers, because they would have learned that they could not expect to take substances from the soil without returning something to replace them. The first object in view was profit, and then ornamentation, and so forth in the secondary sense. He would not advise them to engage in orchard work against those solely engaged in it, but to supply their own household needs throughout the year. Some farmers said they had tried to grow fruit for their own needs and had failed; but possibly that was due to lack of knowledge. The primary consideration was the supply of moisture, particularly with deep-rooted plants. On land having a clayish subsoil and a rainfall of 18 to 20 inches it was possible to grow many fruits to a high state of perfection, and if artificial watering were adopted production could be carried to a still higher standard. Next to moisture was shelter. It was only when one rode a bicycle or tried to grow fruit that one realised how the wind blew. They should observe which trees suitable for shelter fared best in each district. He liked the shea oak for shelter, and the tamarisk, which grew rapidly, and which, under dry conditions, could also be utilised for food for stock. Sugar gums, if used, should be kept a chain away from plantations; pepper trees were good, but almond trees were best wherever they would fruit, because they were profitable. The soil should be prepared by breaking it at least 15 in. deep. They should grow fruits that ripened at a time when they could be picked carefully. Their ripening should not clash with the chief work of the farmer. In the growth of apples the farmer might venture to compete with those dependent on apple-growing for a livelihood. These trees did not require such close attention in pruning as peach or apricot trees. Half a dozen selected varieties of peach trees would supply fruit for the home from the middle of December until the end of March. Plums were useful, as they ripened after the rush of harvest, and a few trees would supply enough prunes for jam-making, canning, and drying. Mr. Quinn gave some useful hints concerning the time to plant, the depths to plant, on pruning, budding, and on tillage. They could not take fruit from trees year after year without returning something to the ground.

Stable manure was the best for an orchard, and the farmer was advantageously placed in having it at hand. The trouble arising from fruit pests and diseases was only a bogey. There were remedies which could be cheaply applied to combat practically all of them. The kitchen, flower, and ornamental gardens were mentioned. They should not try to grow rare plants, but be satisfied with common, yet beautiful, plants. This section of the garden gave the farmer an excellent opportunity to study plant life, which his annual crop did not offer. This branch of gardening needed encouragement, and if the farmer persevered he would secure success sufficient to make his place a home as distinct from a mere habitation. Mr. Quinn answered numerous questions concerning budding, pruning, cultivation, etc. On the Friday afternoon Mr. Quinn gave an interesting demonstration in the pruning of fruit trees, roses, etc.

THE HORSE AND THE COW.

On Thursday Veterinary Surgeon Desmond gave an address on "The Horse and its Diseases" and on Friday on "The Cow and her Diseases." Both lectures were of an exceedingly instructive character, and many points of interest were illustrated by blackboard sketches. Numerous questions were asked on both occasions. Dealing with the horse, he warned them against handling a young horse with a rope around his neck; always use a halter. Use a separate collar for each horse, and do not work a horse suffering from sore shoulders. The slower the sore heals over, within reason, the less the scar. Soak new collars in water to soften them so they will fit the shoulders. For draught horses, fed mainly on chaffed hay, a bran mash every Saturday evening will be of good service in keeping their digestive organs in condition. The stable should slope to the back only enough to ensure good drainage. For sprains, fill an old trouser leg with short straw, and place it on the animal, keeping the straw wet. Iodine will increase the heat and thicken the skin. Medicines for the cow should, as far as possible, be given warm, in liquid form, and be flavoured with ginger, allspice, or treacle. For a month before calving keep the cow on short allowance, to lessen risk of complications after calving. In case of so-called milk fever, inject iodide of potassium or ordinary air into each teat.

MANAGEMENT OF FARM COWS.

Mr. J. G. Folland read a paper, in which he gave some advice on "The Management of Cows on the Farm." Forty years' experience had taught him that it was essential to feed them well. He had proved that good oaten chaff and bran, with a plentiful supply of salt, was the cheapest and best feed. He dealt with the management of cows at calving time, and enumerated a large number of "don'ts." His cattle had suffered heavily from dry bible, but whenever he observed symptoms of the disease he administered Epsom salts, and found that when it operated the cattle recovered. Mr. Folland referred to the results he had obtained from his cows, and mentioned how he had increased the returns.

CO-OPERATION.

Mr. A. Molineux read a paper on Friday evening on "Co-operation." He pointed out its advantages, chiefly from a fruitgrower's point of view. He said the prosperity of any country depended upon its marketable products and manufactures. To ensure a regular demand for any article it must be at all times readily procurable, of consistently good quality, and reasonable price. It should be placed in suitable packages, and be attractive in appearance. Unless these matters received attention there would never be an extensive demand for the produce. Only a few individuals could comply with these necessities, but it often involved the expenditure of enormous sums of money and the energy of a lifetime. If a fruitgrower received a good return of superior fruit, and 20 other growers were similarly favoured, a glut resulted. If, on the other hand, the 20 growers had an inferior yield, and prices ranged, say, from 1s. down to 2d. per lb., there were 20 chances to 1 that the purchaser—say, an English firm—would get the inferior article. In many cases he would decline to have anything more to do with the colonial produce, but sought that from France and America. Co-operative effort caused the product to be inferior to the best, but it was uniform, and superior to the output of unskilled producers. If 21 growers established a factory, and took their fruits there to be dried or canned, the article would be of uniform quality, and would readily create a demand, while the shareholders would partake in the prosperity of the venture. There was necessity for co-operation among gardeners to combat orchard pests. A big grower could often deal with insect and fungus pests and with sparrows and starlings; but his smaller neighbours frequently neglected their part, and the resultant propagation of codlin moth and scale was sufficient to necessitate the larger grower continuing his warfare year after year. If every one co-operated and worked assiduously these troubles could to a large extent be overcome. An official test had recently been conducted in Canada to ascertain the cost per tree for spraying four or five times during the season. It had been found that where 4,000 or 5,000 trees existed in a circle about five miles in diameter spraying could be done at a cost of 2½d. per tree. A 2½-h.p. engine was used, giving a pressure of 100 lb., with a 300-gallon tank and three lines of ½-in. hose, each with six nozzles. The appliances cost £60 in that country. Co-operation was beneficial in grading, packing, railage, shipping, and freightage, and, in fact, with every operation connected with the marketing of produce. Individual growers had to approach shipping companies for redress of grievances, but under co-operation the reverse was the case. The companies would come to them. The individual had to pay high prices for every service and article he needed; co-operation secured the best service, lowest price, and cash discount. The Fruitgrowers' Association and the Farmers' Co-operative Union should be supported by all fruitgrowers and farmers. There was good scope for further work in this direction. The principle of

co-operation had been frequently discussed and approved; but the leading man was always wanting.

DAIRYING.

Mr. P. H. Suter devoted Friday evening to a study of "Dairying." He observed that the main points for success depended upon breeding, feeding, culling of herds, providing general comforts, and cleanliness. In breeding they must aim at increasing their returns by improving the type without sacrificing the constitution, and by considering climatic conditions when selecting a breed. He spoke about the many inferior cattle to be seen in the country, which was the result of using inferior bulls and of stunting the stock in its younger days through an insufficiency of nutritious food. Close breeding was also responsible for many weedy cattle. The bull was half the herd, and, as like begot like, it should have the necessary constitution and be selected from milking strains. He did not hold with the method in vogue of judging bulls at show yards. The beast possessing the best points and type of its breed was awarded the prize, but he recommended that if possible a few of the progeny should be exhibited also, because the value was in the progeny. Dairymen should rear the best heifer calves from the heaviest milking cows. They should be well fed and kept growing, because any check in the growth would influence the yield when it came to the bucket. He did not hold with dairymen rearing bull calves, unless for studs, as it was not work for the true dairyman. Breeding and feeding were unquestionably at the root of the industry. The two went hand in hand, for however well bred a cow might be it would not prove profitable unless it was properly fed. Feeding was half the breeding, but it was one of the weakest points in Australian dairying. Little provision was made in this State for tiding cattle over times of scarcity, and too much dependence was placed on natural pasturage. He strongly recommended the conservation of fodder in the form of silage. It was necessary to supply plenty of food, because the more profitable a cow was the greater amount of feed it consumed. Dairymen should study economy, but care should be taken that succulent, palatable food was given. Succulence could be supplied in winter in green oats, barley, and oats and tares, and right through the year in ensilage. He recommended vigorous and fearless culling of herds. It cost £4 per annum to keep a cow, which amount included interest on capital, labour, and feed. This meant that 120 lb. of butter at 8d. per lb. was required to pay for its keep. A cow should produce from 200 to 250 lb. of butter per annum. In one herd of 30 cows, in Victoria, the best cow gave 326 lb., and the lowest on the list 122 lb. The cost of producing the butter in the former case was 2'9d., and in the latter 7'9d. Mr. Suter emphasised the necessity for making the beasts comfortable, but he believed in attending to feeding first and rugging after. Cleanliness was essential, and he dealt fully with the rearing of calves. He mentioned various rations, and explained the method of balancing, and

of utilising hay, wheat, and straw to profit by mixing concentrated food with it. He threw on the screen numerous views of dairy breeds, and explained the weak and strong points about them. In reply to various questions he advised feeding the calves for first ten days on the mother's milk; give three small feeds daily. For the next two weeks give half skim and half new milk; then skim milk to which a little cod liver oil or linseed meal has been added. Do not rear the bull calves; it will pay better to feed the milk to the pigs. In regard to ensilage he advocated the tub or overground silo. In a tub silo the loss should not be more than 5 per cent., against 10 per cent. in a pit silo, and fully 15 per cent. with stack ensilage.

The Conference closed with a comprehensive vote of thanks to those who had taken part.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.			BRANCH.	Date of Meeting.		
Ardrossan ..	July 12	Aug. 9		Mount Gambier ..	July 8	12	
Bagster ...	15	12		Nantawarra ..	12	9	
Balaklava ..	8	12		Naracoorte ..	8	12	
Booloroo Centre ..	11	15		Narridy ..	15	—	
Bowhill ..	1	5		Norton's Summit ..	14	11	
Brinkworth ..	7	4		Onetree Hill ..	13	10	
Burra ..	21	18		Orroroo ..	14	11	
Cherry Gardens ..	11	15		Penola ..	8	12	
Clare ..	14	11		Penong ..	8	12	
Colton ..	1	5		Petina ..	8	5	
Crystal Brook ..	15	—		Pine Forest ..	11	15	
Dawson ..	15	—		Port Broughton ..	15	10	
Eudunda ..	17	14		Port Elliot ..	15	19	
Finniss ..	3	7		Port Lincoln ..	22	19	
Forest Range ..	13	10		Port Pirie ..	15	12	
Gawler River ..	14	11		Quorn ..	15	12	
Golden Grove ..	13	10		Redhill ..	11	15	
Gumeracha ..	17	14		Richman's Creek ..	17	14	
Hartley ..	14	—		Riverton ..	15	12	
Inkerman ..	11	15		Saddlesworth ..	21	18	
Johnsburg ..	15	12		Stockport ..	17	14	
Kanmantoo ..	14	11		Strathalbyn ..	17	21	
Kingscote ..	10	14		Sutherlands ..	12	9	
Kingston ..	29	26		Utera Plains ..	15	12	
Koolunga ..	13	10		Virginia ..	17	14	
Longwood ..	12	9		Wandearah ..	10	14	
Lyndoch ..	13	10		Wepowie ..	11	8	
Maitland ..	1	5		Whyte-Yarcowie ..	15	19	
Mallala ..	3	7		Willunga ..	1	5	
Meningie ..	8	12		Wilmington ..	12	9	
Millicent ..	6	3		Wilson ..	15	12	
Minlaton ..	8	5		Woolundunga ..	8	12	
Morchard ..	14	18					

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on July 1, 1905:—

It is many years since such excellent and continuous rains were recorded as during the past month: indeed, the exception was for any twenty-four hours to pass without some showers. Certainly this applies more to Adelaide and the Southern Districts, but our Northern agriculturists also have had considerably beyond the average. Therefore, farmers throughout the whole of South Australia have now far brighter prospects ahead than have prevailed for many seasons. News is also just to hand of the break-up of drought conditions in the Northern pastoral country.

COMMERCE.—With our rural districts in such good heart, it is only to be expected that a very healthy tone pervades business throughout, and, although there was no exceptional activity in any particular line, yet the trend was of a sound character. Country buying operations were fairly extensive, considering the wet condition of the roads, whilst in the larger centres of population trade has been steady and solid. **Mining.**—The Barrier Silver and Lead Mines are each week so improving their position that there has been a substantial advance in the share values.

BREADSTUFFS.—Cable advices report the European markets as being very dull, 31/6 per quarter for shipment, and 31/- for cargoes near home, are now outside quotations. The value of Wheat in New South Wales has improved, 3/5½ being obtainable for their f.a.g. sample, which is much inferior to ours this year. Victorian rates remain about the same. In this State little business has been done, excepting in stored Wheat, for which fairly high prices have been paid. **Forage Lines.**—Purchasers of Chaff for export have operated sparingly, and then only for prime green samples; but, as the price offering is a low one, holders are not seeking sales. The Oat market is still active, though hardly so strong, and prices are more inclined to drop. In Feeding Grains trade has been just of the ordinary winter character, no operations of any magnitude having taken place.

POTATOES.—There is a decided disinclination on the part of growers this season to readily dispose of the tuber. In this we think they are wise, for it is now pretty certain that the yield throughout the Commonwealth is far short of late seasons. Coupled with this, there is the fact that, owing to the New Zealand potato failure, growers there have been obliged to operate in Australia for their seed, therefore strong market prevails. Meanwhile, "Gamblers" appear to keep control of country orders, whilst for Adelaide requirements Tasmanians are securing a good portion of the business. **ONIONS.**—South Australian grown are now almost exhausted, and, with supplies in the Eastern States not nearly equal to demands, another sharp rise is recorded.

DAIRY PRODUCE.—As a further proof of the speedy recuperative properties of our country under anything like favourable conditions, South Australia had actually, in the early weeks of June, to import her extra wants in Butters; but, before the end of the month, had not only reached the position of self-supplying in fresh prints, but also did the trade of Broken Hill, besides effecting sales to her neighbours in Western Australia. However, values held remarkably well, the easing being gradual. **Eggs.**—It was generally expected that the seasonable lowering in price was due; but the persistent rains upset this theory, for rates steadily hardened until the highest point for the season was touched, but an increase in quantities then set in, and quotations were at once affected. **Cheese.**—For several months cheese has had a good run of business, which is likely to continue till the new make comes forward. Local brands are now scarcely sufficient for demands and to fill extras parcels have been landed from the East and New Zealand. **Bacon.**—Although there is an absence of export orders on the market, the higher price for other meat has caused a much better call for this line; but anything approaching an advance is precluded, owing to the lower rates ruling elsewhere. **Hams** have very little enquiry. **Honey** is without any shipping orders; but local business is sufficient to keep rooms nicely cleared of all prime offering. **Almonds** have had fair turnover, prices fully sustaining.

In Live Poultry the trade, as usual, gave most of their attention to pens of prime-conditioned birds, which secured good rates; but for poor and light sorts buyers were not disposed to purchase with any freedom.

In Dressed Poultry there was a decided improvement in the quality and condition of the lots forwarded, resulting in better figures being obtained.

CARCASE MEAT.—As the sale for Pork and Veal is at the last market of the week (Friday), farmers would do well to kill and send along for that auction, of course allowing sufficient time to elapse before forwarding for the animal heat to escape and the carcass to dry out. In Pork a nice market ruled for all prime quality, bright, handy, shop sorts commanding highest figures, whilst also medium to good baconers sold well; but for rough sorts and heavy weights lower prices had to be accepted to quit. In Veal there was a strong demand, especially for consignments of prime dairy fed, which realised satisfactory prices.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, $3\frac{3}{4}$ to $3\frac{1}{4}$ per bushel 60 lb.

FLOUR.—City brands, £7/10/- to £7/15/-; country, £7/-/- to £7/5/-.

BRAN, 1/- to $1/0\frac{1}{2}$; **POLLARD,** 1/- to $1/0\frac{1}{2}$ per bushel of 20 lb.

OATS.—Local Algerian and Dum, 1/10 to 2/-, prime; White Champions, 2/3, very few offering.

BARLEY.—Cape, 2/3 to 2/5 per bushel, feed to prime.

CHAFF.—£2/17/6 per ton of 2,240 lb., f.o.b. Port Adelaide, for prime green.

POTATOES.—Gambiers, £6/2/6 to £6/10/- per ton of 2,240 lb.

ONIONS.—£14/10/- to £15/10/- for prime per ton of 2,240 lb.

BUTTER.—Factory and Creamery, fresh, in prints, 9½d. to 11d.; choice Separators and best Dairies, 9d. to 10d.; ordinary Dairy and fair Separators, 8d. to 9d.; Stores and Collectors, 7½d. to 8½d.

CHEESE.—8d. to 9d., large to loaf.

BACON.—Factory-cured sides, 6d.

HAMS.—S.A. factory, 7½d.

EGGS.—Loose, $1/3\frac{1}{2}$.

LARD.—Imported, in bulk, 4½d.

HONEY.—Prime clear extracted, 2½d.; Beeswax, $1/1\frac{1}{2}$.

ALMONDS.—Soft shells (Brandis), 3½d.; kernels, 8½d.

LIVE POULTRY.—Heavy-weight table roosters realised 1/7 to 2/- each; good-conditioned hens and fair cockerels, 1/- to 1/5; mixed sorts, 10d. to 1/-; poor and weedy, 7d. to 9d.; ducks, 1/7 to 2/6; geese, 2/6 to 3/6; pigeons, 3d. to 4½d.; turkeys, 4½d. to 6d. per lb., live weight, for fair to good table birds.

DRESSED POULTRY.—Turkeys, 6½d. to 7½d. per lb.; fowls and ducks, 5d. to 6d.

CARCASE MEAT.—Bright, handy-sized shop porkers, 4½d. to 5d. per lb.; medium to good baconers, 3½d. to 4d.; choppers and rough sorts, down to 2½d.; prime dairy-fed veal, 3½d. to 4½d.; poor to good, 2½d. to 3d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1905:—

Adelaide ...	3.71	Hoyleton ...	2.36	Macclesfield ...	4.09
Hawker ...	1.64	Balaklava ...	2.23	Meadows ...	5.53
Cradock ...	1.69	Port Wakefield ...	1.39	Strathalbyn ...	3.02
Wilson ...	1.26	Saddleworth ...	3.20	Callington ...	1.66
Gordon ...	0.63	Marrabel ...	2.55	Langhorne's Bridge ...	1.67
Quorn ...	1.24	Riverton ...	3.17	Milang ...	2.77
Port Augusta ...	0.90	Tarlee ...	1.65	Wallaroo ...	2.18
Port Germein ...	1.64	Stockport ...	1.43	Kadina ...	2.40
Port Pirie ...	1.84	Hamley Bridge ...	1.99	Moonta ...	3.05
Crystal Brook ...	2.22	Kapunda ...	2.16	Green's Plains ...	2.99
Port Broughton ...	2.80	Freeling ...	1.84	Maitland ...	2.82
Bute ...	2.99	Stockwell ...	3.56	Ardrossan ...	1.88
Hammond ...	0.77	Nuriootpa ...	4.63	Port Victoria ...	2.30
Bruce ...	0.81	Angaston ...	3.88	Curramulka ...	2.98
Wilmington ...	2.50	Tanunda ...	4.34	Minlaton ...	3.01
Melrose ...	3.14	Lyndoch ...	3.81	Stansbury ...	2.95
Booleroo Centre ...	2.14	Mallala ...	2.26	Warooka ...	3.23
Wirrabara ...	3.31	Roseworthy ...	2.27	Yorke town ...	3.06
Appila ...	2.10	Gawler ...	3.79	Edithburg ...	2.42
Laura ...	2.32	Smithfield ...	3.12	Fowler's Bay ...	1.61
Caltowie ...	1.78	Two Wells ...	1.98	Streaky Bay ...	3.95
Jamestown ...	2.39	Virginia ...	2.59	Port Elliot ...	2.21
Gladstone ...	2.42	Salisbury ...	3.07	Port Lincoln ...	3.37
Georgetown ...	2.74	Tea Tree Gully ...	6.08	Cowell ...	0.93
Narridy ...	2.20	Magill ...	5.28	Queenscliffe ...	3.04
Redhill ...	2.21	Mitcham ...	5.81	Port Elliot ...	4.33
Koolunga ...	2.36	Crafers ...	11.13	Goolwa ...	3.69
Carrieton ...	0.73	Clarendon ...	6.93	Meningie ...	4.92
Eurelia ...	0.86	Morphett Vale ...	3.88	Kingston ...	6.14
Johnsburg ...	0.86	Noarlunga ...	2.93	Robe ...	4.61
Orroroo ...	1.21	Willunga ...	3.58	Beachport ...	4.94
Black Rock ...	0.85	Aldinga ...	2.47	Coonalpyn ...	3.70
Petersburg ...	1.60	Normanville ...	4.21	Bordertown ...	3.48
Yongala ...	1.89	Yankalilla ...	4.22	Wolseley ...	4.57
Terowie ...	1.45	Eudunda ...	2.04	Frances ...	2.88
Yarcowie ...	1.30	Truro ...	3.64	Naracoorte ...	3.56
Hallett ...	1.74	Palmer ...	2.42	Lucindale ...	3.94
Mt. Bryan ...	2.27	Mount Pleasant ...	4.32	Penola ...	3.69
Burra ...	2.58	Blumberg ...	6.33	Millicent ...	3.76
Snowtown ...	1.33	Gumeracha ...	7.91	Mount Gambier ...	4.64
Brinkworth ...	1.73	Lobethal ...	7.47	Wellington ...	1.74
Blyth ...	2.65	Woodside ...	5.76	Murray Bridge ...	1.88
Clare ...	4.30	Hahndorf ...	7.04	Mannum ...	1.31
Mintaro Central ...	3.70	Nairne ...	4.38	Morgan ...	0.62
Watervale ...	4.42	Mount Barker ...	6.73	Overland Corner ...	1.48
Auburn ...	3.93	Echunga ...	6.68	Renmark ...	1.44
Manoora ...	2.69				



AGRICULTURAL BUREAU REPORTS.

Wilmington, May 24.

PRESENT—Messrs. Robertson (chair), Slee, Schuppan, Hannigan, Noll, Sullivan, Broadbent, McLeod, Bauer, Francis, and Payne (Hon. Sec.), and two visitors.

FORMALIN.—In reply to question the Chairman stated that he used formalin last year as a preventive of bunt, but the wheat only came up in patches. He could not say whether this was due to the very dry condition of the soil when the seed was sown or to some other cause. Those plants that grew were free from any sign of disease. Members thought that the experiments reported on by Mr. Roediger, of Gawler River, showed conclusively that formalin injured the seed more than bluestone. Matters of formal business were transacted.

Utera Plains, May 20.

PRESENT—Messrs. W. Jacobs (chair), F. Jacobs, Abrook, Deer, R. and H. West, H. S. and W. Chase, Gall, D. G., A., A. R., and A. R. S. Ramsey (Hon. Sec.), and one visitor.

SEED WHEAT.—Mr. A. R. Ramsey read a paper on the best kind of wheat to sow to produce a good crop. First, the seed wheat should be grown on clean land, as wheat from dirty land will produce an inferior crop, no matter how well the seed is prepared. Farmers, as a rule, were not sufficiently particular about this point. All small seed, broken grain, and foreign matters should be removed from the seed wheat. A day occupied in cleaning the seed will save a week's work with a team of horses ridding the land of objectionable weeds. Well-cleaned seed will also produce a better and more even crop. Let any one examine a crop grown from an ordinary sample of wheat; he will find a large percentage of small, weakly plants, which, if they come to maturity, will yield only inferior grain. He advised sowing a large, plump grain whenever possible. They should follow the example of all successful stockbreeders, and grow only the best. For this district he thought Gluyas the best wheat they had tried. Members discussed the paper freely, agreeing with the main points.

Watervale, May 22.

PRESENT—Messrs. Williams (chair), Ashton, Scovell, Solly, Trelcar, and Castine (Hon. Sec.), and one visitor.

FLY PEST.—Mr. Williams initiated discussion on losses of sheep from the attacks of the "English fly." This pest had been worse than usual this year, the ewes on timbered and clear land suffering equally. He found the most effective treatment was to make a narrow race from 50 to 60 ft. long, and put the sheep through this in single file, syringing each with Cooper's or other reliable dip on the rump and back. This was a safe yet effective way of treating the sheep. Members reported that the lambing had been good, but a number of the early lambs were lost during the severe weather at Easter time.

POISONOUS CAPE TULIP.—Mr. S. Solly reported severe loss of dairy cattle through poisoning. His brother was bringing a number of cattle back from the North, and when about eight miles from Clare they came on a stretch of road eaten bare by a flock of ewes which were lambing on the road; a little further on there was a green patch of "Cape tulip," on which the cattle fed, with the result that a large proportion of them died. Members thought steps should be taken to post notices on roads and reserves where poisonous weeds were known to be growing.

Nantawarra, May 17.

PRESENT—Messrs. Nicholls (chair), Herbert, Belling, Bierwirth, Dall, and Dixon, and one visitor.

CROPPING STUBBLE LAND.—Paper on this subject read at Riverton by Mr. Kelly was discussed. Mr. Dall said that when cropping stubble land it was better to use the cultivator instead of ploughing the land. He would not sow more than a bushel of seed per acre: 75 lb. was too much. With regard to manure, he would apply a heavier dressing to fallow land than to stubble. The Chairman would scarify stubble land, while Mr. Herbert advised skimping. The latter found oats did fairly well on wheat stubble. In reply to query by the Chairman, members were undecided as to whether as a general practice sufficient seed was applied to secure the best results.

LEADING WHEELS ON IMPLEMENTS.—In reply to question as to value of leading wheels on drills, none of the members had any experience of their use. They were agreed that on cultivating implements the leading wheels should be fairly wide apart.

Woodside, May 22.

PRESENT—Messrs. Hutcheus (chair), Johnston, Moore, Schroeder, James, Morcom, Keddle, Drummond, and Hughes (Hon. Sec.).

ROTATION OF CROPS.—Mr. H. James read a short paper on this subject. He thought they might pay more attention in this district to rotation as a factor in successful farming. All of them knew how a cereal crop was benefited by the growing of a leguminous crop the previous season, yet it was surprising to see how little attention was given to the latter. The ordinary field pea can be grown successfully in this district, and can be turned to profitable account, especially where dairying is practised. He favoured sowing early, as the land can be worked better then than later on. He would sow 2 to 2½ bushels per acre, and be liberal also with manure. He found bonedust or guano most satisfactory for the pea crop in this district. At present rates guano was cheaper than bonedust. Harvesting can be done with the pea rake or the pea harvester attached to the ordinary grass-cutter. For heavy crops the former will give more satisfaction, as it pulls the plants tightly together, thus preventing damage by wind. The rake will leave some peas on the ground, but not more than some men using a scythe, and the pigs or sheep will gather these up. Members generally agreed with Mr. James, but thought the dressing of 2 cwt. bonedust or 3 to 4 cwt. guano per acre rather heavy for some soils. In reply to question, Mr. James said the seeddrill cracked the peas, and he found it a good plan to let them lay on a damp floor for some time before sowing, as when damp there was much less damage by cracking in the drill.

Bute, May 16.

PRESENT—Messrs. Gitsham (chair), Sharman, Hamdorf, Masters, Cousins, and McCormack (Hon. Sec.).

SEEDING.—Mr. Sharman read a short paper on this subject. He thought Marshall's No. 3 had given the best results on the whole in this district during the past few years. It should be sown as early as possible. Silver King and Majestic possessed most of the good qualities of No. 3, and were better hay wheats, but were a little later in maturing. For late sowing Gluyas was the best variety. It was rust-resistant, yielded well, and did not shake, but will go down badly if not reaped as soon as ripe. The straw was too hard and wiry to make good hay. Carmichael's Eclipse was similar in many respects, and stands up better than Gluyas, but was not such a good milling wheat. Of the first three he would sow 1 bushel per acre, and of the two latter 75 lb. Mr. Masters agreed with most of the paper, but considered the seeding too heavy. He obtained best results with 45 lb. per acre of the stooling varieties, and a little more of the other kinds. Mr. Cousins and the Hon. Secretary agreed. Early in the season they would sow even less than 45 lb. per acre.

Bagster, May 20.

PRESENT—Messrs. Freeman (chair), Roberts, E. F. C. and C. Brown, Hayes, Higgants, Payne, and Gravestocks (Hon. Sec.), and five visitors.

FARM HORSES.—The Chairman read a paper on "The Best Stamp of Farm Horses for this District." Being a long way from market, their horses were naturally much on the roads, consequently they required a good, all-round horse. They must have a horse with a fair amount of weight, fairly clean in the bone, and generally what was termed an active, nuggety animal. Very heavy animals were not suitable for their work, neither did they want the horse with long, narrow body and heavy legs. Members generally agreed with the Chairman.

Lipson, May 13.

PRESENT—Messrs. Potter (chair), Thorpe, Bratten, Baillie, McCallum, Hudson, and Barraud (Hon. Sec.).

HAY CROPS.—Mr. Thorpe advocated cross-drilling for hay, his experiments last season having proved a success. Mr. Hudson stated that he knew of an instance where $4\frac{1}{2}$ tons of hay per acre were obtained from land that was cross-drilled with 1 bushel wheat and 1 cwt. super per acre, each way. Members wished to know whether hay grown on land manured with super would be of better quality or otherwise than hay grown on land dressed with stable manure. [The super will usually produce a finer quality straw. Where a heavy dressing of stable manure is applied the straw will be coarse and rough.—ED.]

Wilson, May 13.

PRESENT—Messrs. Harrison (chair), Hilder, Logan, Need, Nelson, Sexton, Ward, Crossman, Barnes, and Neal (Hon. Sec.), and six visitors.

RABBIT DESTRUCTION.—Considerable discussion on the suppression of the rabbit pest took place. It was resolved to recommend the following action:—That the Government should wire-net certain districts, and declare them vermin districts. That an efficient inspector be appointed by the Government, and power given him to compel the landholders to clear their land to his satisfaction. If such action is not taken, the landholder to be prosecuted and men put on to destroy the rabbits at his expense. In the event of two convictions being secured against the same person for neglect to destroy rabbits, the lease should be forfeited.

Reeves Plains, May 18.

PRESENT—Messrs. R. Oliver (chair), W. Oliver, Day, Forrest, Richter, George, Arnold, Wasley, and McCord (Hon. Sec.).

PRICES OF HARVESTING MACHINERY.—The Chairman read a paper dealing with alleged combination amongst importers and local makers of cultivating and harvesting machinery to raise prices. He believed that it had been agreed to raise the price of harvesters to £85 each, an increase in some instances of £15. He thought, especially in view of the requests of certain Victorian makers for a heavy duty on harvesting machinery, that the farmers should take this matter up strongly with a view to preventing a few manufacturers securing a monopoly of the business, and charging such prices as they chose for their machines. Other members agreed, and it was resolved—"That this Branch strongly protests against the action of the makers in combining to raise the prices of harvesting machinery, and that the attention of other Branches be called to the matter." Members thought farmers should refuse to buy at enhanced prices.

HORSES ROLLING IN HARNESS.—Mr. Day called attention to the danger of allowing horses to roll when they have the collars and hames on. A young horse of his tried this recently, and nearly broke its neck, the hames sticking in the ground. It was some days before the animal recovered from the twist it gave its neck.

Eudunda, May 15.

PRESENT—Messrs. Walter (chair), Gosling, J. and E. T. Pfitzner, Sieber, and Weil, and two visitors.

FIELD TRIAL.—It was decided to arrange for a field trial of ploughs and cultivators.

RETROSPECTIVE FARMING.—Mr. W. H. Marshall read a paper on this subject, describing the methods adopted in former years, and comparing them with present conditions. He referred to the necessity for greater attention being paid to the improvement of their present practices in order to get the best results from their land. Improvement of wheat by selection and cross-breeding was an important item. A careful study of the soil and its requirements was also necessary. Education must play an important factor in farming, and he thought their agricultural shows could be made of far more value in this direction.

Brinkworth, June 2.

PRESENT—Messrs. McEwin (chair), Wooldridge, Ottens, Morrison, Hill, Brinkworth, and Stott (Hon. Sec.), and two visitors.

HARROWING AFTER DRILLING.—Considerable discussion on this subject took place. Most of the members were agreed that it was advisable to harrow lightly immediately after sowing.

ATTENDANCE OF MEMBERS.—It was decided to intimate to members who have failed to attend regularly that their names will be struck off the roll unless they attend meetings in the future. Various suggestions were made with a view to infusing fresh life into the work of the Branch.

Maitland, May 6.

PRESENT—Messrs. Jarrett (chair), Kelly, Smith, Heinrich, and Tossell (Hon. Sec.).

HORSES STUMBLING.—Some of the members attributed this failing to poor eyesight, while others thought defective structure the main cause.

PICKLING SEED WHEAT.—Mr. Smith reported having proved formalin an effective pickle for wheat, and recommended its use, as the plant grew better and was less subject to bunt than where bluestone pickle was used. As an experiment he rubbed some bunt balls with clean wheat to thoroughly infect the seed, and then divided it into three lots. One was sown dry, unpickled, one was pickled with bluestone, and the third lot with formalin. On the first plot half the plants were bunted, on the second there were signs of the disease, but on the formalin plot he could not find an infected plant.

Longwood, May 26.

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Ginn, Cheeseman, McGavisk, Vogel, Antuar, Russell, and Hughes (Hon. Sec.), and four visitors.

DRIED FRUITS.—Several samples of dried fruits were exhibited:—Northern Spy apple, of excellent flavour but poor colour; Washington Gage prune, a showy, light prune, but not considered equal to French prune for cooking, the latter being sweeter.

PEARS FOR WET LAND.—It was suggested that on wet land pears should be grafted beneath the ground-level on to quince stocks. It was stated that with shy-bearing pears, if quince scions are grafted on to seedling pears and then the pear on to the quince, the pear will fruit regularly.

Mount Bryan, May 20.

PRESENT—Messrs. T. Wilks (chair), E. S. Wilks, Teddy, Thomas, Quinn, Dunstan (Hon. Sec.), and one visitor.

CASTRATING RAMS.—A long discussion on the castration of young rams took place. Most of the members favoured pulling the testicles away, as was done with ram lambs, but some favoured splitting the division between the two testicles to remove the second one.

LUCERNE.—Members favoured sowing lucerne in February or March, especially if good rains occur, as lucerne sown then, if it starts well, makes much better growth than the August seeding.

Onetree Hill, May 19.

PRESENT—Messrs. Ifould (chair), Blackham, G. and F. Bowman, W. and E. A. Kelly, Thomas, and Clucas (Hon. Sec.).

STORING HAY.—One member stated that he found hay kept its fragrance and flavour better under a covered shed than in a stack in the open.

RABBIT-PROOF FENCING.—This subject was discussed at length, and co-operation amongst farmers in wirenetting their farms was strongly recommended. It was pointed out that some of the netting and barbwire now on the market was practically useless. Members did not believe in looking to the Government in every case of difficulty; but when a public fraud of this character was perpetrated it was a matter of serious consequence to the State.

DISCUSSION OF SEASONABLE TOPICS.—It was suggested that greater interest would be manifested in the meetings if care was taken that the subjects for discussion were opportune or seasonable. Members thought that, as a rule, this generally obtained, seeding and kindred subjects being freely discussed at recent meetings of the Branches.

WINTER FEED ON LUCERNE PADDocks.—Mr. Ifould stated that, as there was practically no growth of lucerne during the winter, he had put in rape on his lucerne field, giving it a dressing of manure. He did not think this would in any way injure the lucerne, while it would provide seasonable feed.

RESIGNATION OF CHAIRMAN.—Mr. J. Bowman tendered his resignation as member, on account of his inability to attend meetings in the future. A hearty vote of thanks was accorded to Mr. Bowman for his services as Chairman during the past nine years.

Quorn, May 20.

PRESENT—Messrs. Thompson (chair), Toll, Smith, Rowe, Noll, Patten, Cook, McColl, Brewster, and Walker (Hon. Sec.).

DOES POULTRY-KEEPING PAY?—Mr. Cook read a short paper on this subject, giving financial results of his poultry from March 19, 1904, to March 18, 1905. His poultry consisted of White and Brown Leghorns, Langshans, and common fowls, as well as a few turkeys. The following statement shows the financial position:—

To stock on March 19, 1904—100 head at 1s.	...	...	...	£5	0	0
Feed—23½ bags wheat	...	...	...	11	10	4½
Bran and pollard	...	...	...	0	18	1
Balance to profit	...	...	...	9	9	9
Total	...	...	...	£26	18	2½
By Eggs—437½ dozen	...	...	...	£12	11	11½
18 Turkeys and 51 Fowls sold	...	...	...	7	1	3
Stock—145 at 1s.	...	...	...	7	5	0
Total	...	...	...	£26	18	2½

The eggs averaged 6½d. per doz., and the profit shown was equal to 3s. 7½d. per week. All the food had to be purchased. The poultry were housed in a galvanized-iron shed. The perches were made tickproof by inserting posts of gaspipe, around which were soldered receptacles to hold kerosine. The perches rested on the posts, and could be readily taken apart. The floor was hard earth, tarred, and was easily swept out. He got about a barrow-load of manure each week. Members thought farmers who did not have to buy feed for their fowls should be able to make a greater profit than shown by Mr. Cook; but there must be judicious selection of stock, and care taken to raise chicks at the right time, viz., so that they come into laying before winter sets in.

Inkerman, May 16.

PRESENT—Messrs. W. Fraser (chair), D. Fraser, Mugford, Williams, Daniel, Lomman, Higgs, and Smart (Hon. Sec.), and one visitor.

GRADING SEED WHEAT.—Mr. Lomman initiated a discussion on the value of the grader. He thought it was a great advantage to have all the small and broken wheat and foreign seeds removed, as these could be profitably fed to pigs or fowls, whereas, if sown, they were worse than wasted, as they make the land dirty, and cause a lot of extra labour afterwards. Then, in a rusty season, it often happens that only a portion of the grain is injured; this could be separated by means of the grader, and kept for feed purposes, while the sound grain could be marketed at full rates. It would pay better to do this than to sell the whole crop at a reduction in price. Members generally admitted the value of the grader; but the cost required to be reduced to bring it within the reach of the average farmer. If the rule of "like begetting like" applied to grain equally as well as to stock, the sowing of nothing but good, sound grain should result in an improvement in the average sample of wheat.

TAILING LAMBS.—In reply to question as to best age at which to tail lambs, members agreed that, the condition of the weather and the lambs being favourable, the operation should be performed when the lambs were about four weeks old.

Hartley, May 19.

PRESENT—Messrs. Wundersitz (chair), J. and T. Jaensch, Pratt, Wells, Reimers, and Brook (Hon. Sec.), and one visitor.

CATTLE COMPLAINTS.—Discussion on treatment of cattle complaints took place. Members reported having very little experience with diseases amongst their stock. Mr. Wells said that for inflammation after calving he found the following drench useful:—Boil 2 quarts draught beer, and mix with it 8 ozs. Epsom salts. Give this warm.

Pine Forest, May 16.

PRESENT—Messrs. Bayne (chair), Johns, Edwards, and Barr (Hon. Sec.).

RABBIT DESTRUCTION.—Discussion on this subject took place. Mr. Edwards thought, where poisoning was necessary, the work could be carried out more effectively and economically by the District Council authorities. He would be willing to pay a vermin rate equal to half the general rate, provided the Council undertook the work of keeping the pest in check. The Council could purchase a poison cart, and keep it going throughout the district at the right seasons for poisoning. Mr. Barr agreed, and thought the money spent on the Vermin Inspector could be better spent on a "vermin destroyer." The Chairman stated that one of his neighbours had made a poison distributor, which he had hired out to the farmers, with the result that the Tickera coastline, which was formerly badly infested with rabbits, was now almost cleared. It was agreed that, generally, the rabbits were no more numerous now in the district than at any time during past ten years.

Angaston, May 20.

PRESENT—Messrs. Rundle (chair), Shannon, Friend, Thorn, Evans, Snell, Trimmer, Salter, Player, and Matthews (Hon. Sec.), and several visitors.

FARMING.—Mr. A. Shannon read a paper on this subject to the following effect:—Farming of to-day was very different to that of ten or twelve years ago, when many farmers were thinking of turning their attention to some other means of earning their living. The results of experiments with phosphatic manures—first distributed broadcast, and later on applied by the aid of the seed and fertiliser drill—showed farmers that better days were in store, though many were very slow to realise what the drill and fertilisers meant to them. Most of the land was prepared for the cereal crop by bare fallowing. This work should be started as soon as possible after seeding is finished, in order to let the winter rains penetrate the broken up land. Depth to plough must be regulated by the soil, as the subsoil must, on no account, be brought to the surface. The harrows should follow the plough closely, to break down the clods. If this be done, after operations with the cultivator are rendered much easier, and a better tilth is secured. Where sheep are kept, they can be utilised to eat the weeds, in which case it will not be necessary to use the cultivator until about the end of spring. The soil must, however, be worked before it gets dry, in order to lessen evaporation, and also the blowing away of the surface soil. If rain falls after the cultivator is used, stir the surface with the harrows; but, if the land shows signs of weeds, use the cultivator again. Owing to damage by rust, farmers were compelled in most districts to grow what were termed ‘rust-resisting’ wheats, and to leave the old soft wheats alone. These rust-resisting wheats, as a rule, were more difficult to thresh; but this objection had been overcome by the use of the complete harvester. He found it paid him to sow only the best of seed. In regard to manures, there were a number of brands of super on the market, and good results were obtained from all, though most farmers favour some particular brand. All, however, fight shy of sticky supers. He used 90 lb. to 112 lb. per acre. He considered the practice of burning stubble a wasteful one. If the land is not to be cropped again the following season, the stubble should be left; but otherwise it will pay to gather it and stack it for use when food was scarce. If well cared for, straw seems to improve as it ages; at any rate, it was better liked by stock. The farmer of the present day should combine dairying, pig-breeding, poultry-keeping, and sheep with wheatgrowing. The fat-lamb industry was most profitable; but care must be taken not to overstock. In reply to questions. Mr. Shannon said the best wheats for hay were White Tuscan and Majestic, and for grain Marshall's No. 3. He favoured harrowing cross-ways after drilling, and rolled the crop when about 3 inches high. He only cropped his land once in three years. For picking he used 1 lb. blue-stone to 5 galls. of water, dipping the wheat, and then emptying the wheat out to dry. For early sowing he used 45 lb. seed, and for late sowing 1 bushel per acre.

Mount Remarkable, May 18.

PRESENT—Messrs. Caseley (chair), G. P. and T. P. Yates, W. J. and F. F. Smith, Foot, Morrell, McIntosh, Ey, Oldland, Giles, and O'Connell (Hon. Sec.).

EGG-LAYING COMPETITION.—General discussion on results of recent competitions took place. While considerable differences of opinion were expressed as to breeds, the White Leghorn and Silver Wyandotte met with most favour.

FARM AND DAIRY PRODUCE.—Mr. T. Casely read a paper on this subject. It was essential that the farmer should utilise every available portion of his farm either in the growing of crops or the pasturing of stock. Some farmers argue that wheatgrowing does not pay, while others seem content with the results of combining the growing of wheat with the keeping of sheep and dairy cattle. In this district there were farmers of the latter class who crop their land every third year, broadcasting the seed in the old way, and not applying manure. They are apparently satisfied with an 8-bushel harvest, and argue that it pays better than to buy manure and put the crop in with the drill, which takes more horses, and consequently there is more labour

and more horsefeed required. It is contended that grazing the land with sheep and cattle for two years supplies all the manure necessary. Where dairying is engaged in, crops must be grown for ensilage to tide the stock over the summer and autumn. Mixtures of wheat, rye, rape, peas, etc., can be grown for this purpose. It was sheer folly to expect the cows to return the full profit from dry pasture containing little more nourishment than wood shavings. He maintained that there were many farmers in this district who could produce more on their holdings if they would only give this matter attention. They could grow a little in the way of turnips, mangolds, carrots, etc., for their stock. He knew the usual reply would be that this entailed too much labour, and while he would not advise them to grow such a large quantity of any of these products as to take up time which should be given to other farm work, he would remind them that such crops would render it unnecessary to purchase out of their hard-earned cash copra cake, oilcake, etc. In his opinion, if the farmer purchases the equivalent of an article that can be economically produced on the farm, it is evidence that there is something wrong with the man. A sufficient supply of foodstuff being provided for dairy stock, all the calves should be reared and well fed from the start: pigs in sufficient number to utilise the waste products must be kept. The pigs must be kept always in good condition, and as soon as they were fit to sell they should be disposed of and others bred or bought to replace them. Poultry should be kept, and if properly looked after will prove profitable. With all stock, get the best possible. In the disposal of their produce they lacked union, and were afraid of one another, with the result that they carted their wheat in, and took what the wheatbuyer was pleased to offer: their butter, cream, eggs, pork, etc., were all placed in the hands of the middleman, and the result was the producer did not realise the profits he was entitled to. The paper gave rise to considerable discussion, each member taking part. Some thought the cost of a pit for ensilage too great. Most members favoured sowing some lucerne seed with the wheat in favourable situations, as with fair rains during the summer this would provide a lot of feed for stock.

Petina, May 20.

PRESENT—Messrs. W. Penna (chair), R. and A. Penna, Johnston, Beyton, Newben, and Fiddaman (Hon. Sec.), and two visitors.

FEEDING STOCK.—Mr. Cocks said he found a mixture of treacle and cocky chaff excellent feed for horses. Other members said they found their stock soon got tired of treacle. Sulphate of iron was recommended for fowls and also for stock on grass land, especially where there was no ironstone. Mr. W. Penna asked what was the cause of a sick horse sitting on its hind legs and repeatedly turning its head to its side? [Veterinary Surgeon Desmond says the animal is evidently suffering from some disorder of the digestive organs. Read articles on this subject in previous issues.—Ed.]

PLOUGHING.—Mr. G. Newben read a paper on this subject. It was always best to plough after rain in this district, but often they could not wait, and were compelled to plough the land dry. There was no doubt they would have to till the land better here than in former years, as it will not pay to apply manure on badly cultivated ground. On new scrub land he would plough in the stubble from the first crop, as it will assist to prevent the land drifting; but on old land, wait until the grass starts. Fallowing should be started early in June, and finished before the end of August. He liked to plough in lands about three chains wide, and break all the ground, not leaving corners, as was so often done. From three to five inches was deep enough to plough in this district. There were many new implements on the market, but few of them did work equal to that of the old single and double-furrow ploughs. The five and six furrows they were using now did not do such good work as the old set plough. What they wanted was a plough that would run light and jump well: the least number of horses required for it the better. Mr. W. Penna said he did not agree in waiting for the rain, as the farmer needed to start the plough as soon as he finishes harvest work. Members wished to know the best way to apply superphosphate, viz., broadcast or with the drill, and also if the manure keeps good for a year if not used. [The manure gives best results when applied with the drill, especially where only small quantities are applied. See report of Gawler River Branch re deterioration of manure.—Ed.]

SORE SHOULDERS IN HORSES.—Some discussion on this subject took place.

Gawler River, May 19.

PRESENT—Messrs. H. Roediger (chair), F. and P. Roediger, Winkel, Hayman, Hillier, Kreig, Parker, Baldwin, and Leak (Hon. Sec.).

DOES WHEATGROWING PAY?—This subject was discussed at length, members coming to the conclusion that, at present prices, wheatgrowing, by itself, would not pay in this district; but, with mixed farming, a fair living can be made.

DETERIORATION OF MANURE.—Some discussion took place on the question whether manure lost in value if kept over for a year. Some members reported poor result where the previous year's purchases were used, while others could not notice any loss in value owing to the manure being kept for a year. [The question of loss in manure owing to long storage cannot be answered definitely, as very much depends upon the character of the manure and the process of manufacture. With well-made superphosphate, the reversion of water-soluble phosphate should not be great, if the manure is kept in a dry store. The Inspector of Fertilisers states that, on several occasions, he has had samples tested, with the result that the percentage of water-soluble phosphate has been reduced by less than 3 per cent.; other samples have shown greater loss.—Ed.]

POISON WEED.—Mr. Winkel called attention to the weed known as "Deadly nightshade." Some years ago his neighbours' cattle trespassed on his garden, and ate down some bushes of this plant, without suffering any injury; but a little later on his own young stock broke in, and ate down the new shoots, with fatal results.

Willunga, June 3.

PRESENT—Messrs. Malpas (chair), Pengilly, Brown, Valentine, and Hughes (Hon. Sec.).

CURRENT DRYING.—Mr. Brown read a paper on this subject to the following effect:—In order to produce a first-class article it was essential to allow the currants to ripen properly on the vines. The berries should be of a dark purple colour, and sweet to the taste, the stem of the bunch being slightly browned before they are gathered. If the fruit is gathered too soon the berries will dry a light pink colour, and will be lacking in sweetness, besides being lighter in weight. The standard tray adopted here and in other parts of South Australia is 4 ft. 6 in. long by 2 ft. 3 in. wide, but at the irrigation settlements on the Murray a 3 ft. x 2 ft. tray is favoured. The trays are usually made of the cheap American laths, nailed to three oregon cross pieces, with a thin strip on both sides, to stiffen the tray and to prevent the bunches falling off. In spreading the bunches to dry, they must not be laid too thickly, otherwise they will dry unevenly. Under favourable conditions drying will not take more than five or six days. Turning the fruit about the third day will hasten the drying process, and will assist to secure uniformity in the sample. Turning is accomplished by placing an empty tray upside down on the tray to be turned, and, with a sharp, even swing, reversing the trays. When the berries will leave the stem freely and still feel a little moist, they are ready for rubbing off into the sweating bin. Sweating is necessary to secure an even sample, as some fruits will always dry more than others on the trays. A sieve with a 5-16 in. mesh is generally used when rubbing off the berries. This is placed on the top of the bin. The tray of fruit is tipped into the sieve, and by rubbing with the hands and slightly shaking the sieve the small fruit will fall through, leaving the large fruits, which have seeds, on the tray. These latter are usually termed "bucks." The "bucks" may require further drying, and must be kept separate. In cleaning and grading the currants the ordinary winnowing machine, if properly set, is very useful. The good currants will only require one winnowing, but with the "bucks" it pays to put the spottings through again. When cleaned, the currants are bagged or boxed for market in 56-lb. parcels.

DAIRYING.—A little discussion took place on the question of the age at which heifers should calve. Members would like the opinion of the Professor of Agriculture and the Dairy Instructor on this point. Two members stated they had first-class cows, which had calved when two years of age, and apparently early calving had not interfered with their development. [In my opinion, the heifer should not come in before she is two years and four months old.—Ed.]

Koppio, May 18.

PRESENT—Messrs. Gardiner (chair), Howard, Jacobs, Newell, Miller, Roberts, McNair, F. and R. Richardson, Thompson, and Brennand (Hon. Sec.), and four visitors.

PICKLING SEED WHEAT.—At previous meeting Mr. J. O. Jacobs read a short paper on this subject. He did not consider it necessary to pickle clean seed sown before the first rains; but, after that, all seed should be pickled. For clean seed, 4 ozs. bluestone, dissolved in 2 galls. water, was sufficient for a bag of seed; but with infected seed he would use $\frac{1}{2}$ lb. bluestone and $\frac{1}{2}$ lb. of salt in 3 galls. water. Members generally agreed with the paper, and the different methods of pickling were referred to. Members were unanimous that, whatever system was adopted, it was essential that the seed be thoroughly pickled, and given time to dry before being sown.

TREE PLANTING.—Mr. A. Howard read a short paper on "Planting Fruit Trees." In his experience of ten years in this district he had not lost more than four trees out of about 200 he had planted, and he would advise new settlers to plant a few trees at the first opportunity, as he was satisfied they would soon be repaid for their trouble and expense. In planting he would have the holes all ready a week or more beforehand. Choose a fine day for the work, and cut off all dead or bruised roots: spread the roots out well, cover them with fine friable soil, treading it down firmly, then fill up the holes. June and July are the best months for the work. In September it will pay to put on a mulch of stable manure or litter. Considerable discussion ensued, members commenting on the healthy appearance of fruit trees in this district. Mr. Howard said that Rome Beauty and Nickajack apples had done well here.

DISC. r. HOE DRILLS.—In reply to question, members who have used both kinds of drills state they find the disc drill the better for use where there is much straw or rubbish on the land.

Carrieton, May 19.

PRESENT—Messrs. Gleeson (chair), Harrington, Hupatz, Ormiston, W. and A. Steinke, Fisher, and Bock (Hon. Sec.).

TURKEY COMPLAINT.—Mr. Ormiston stated that he found the following treatment effective for "swelled head" in turkeys:—With a sharp instrument make a slight incision along the swelled part, and wash with a mixture of salad oil and eucalyptus oil. [Mr. D. F. Laurie states that he has frequently recommended similar treatment with successful results. Applications of iodine or carbolic acid, and, in severe cases, perchloride of mercury, are valuable. The latter is dangerous, and must be used with great care. The disease known as "swelled head" is very frequent amongst turkeys, but it can be avoided by proper care.—Ed.]

Calca, May 27.

PRESENT—Messrs. J. J. Roberts (chair), A. Roberts, Smith, Plush, Thomas, Lewis, Crowder, and Newbold (Hon. Sec.), and four visitors.

BAGS AS WHEAT.—Mr. Plush initiated a discussion on the practice of selling bags as wheat, which he considered unfair to the farmer. Mr. Smith agreed, and considered the buyer was making a large profit out of the farmer on the bags.

STANDARD BUSHEL.—This subject was also discussed, the opinion being expressed that under the present system the farmers did not get a fair return for their labour. The Chairman said it would not pay any farmer to clean his wheat well, as he got no more for it than for wheat just good enough to pass the standard.

GOOD CULTIVATION.—Discussing this subject the Chairman mentioned an instance where two young farmers in one of the driest parts of the West Coast had increased their average yield from 4 bushels to 10 bushels by fallowing. They made it a practice to fallow the land directly after seeding, and to harrow it in the spring and summer, after each fall of rain. At a previous meeting, Mr. Wilcot stated that he drilled in some land with super and some without. The later portion was harrowed once a month until it started to run up to head, and it yielded quite as much per acre as the manured land.

Millicent, June 1.

PRESENT—Messrs. McRostie (chair), Stewart, Boneham, Harris, Hutcheson, Mutton, Oberlander, Varcoe, Souckey, Hart, and Campbell (Hon. Sec.).

LEAF RUST.—The Hon. Secretary called attention to enquiry by Wepowie Branch as to experience with leaf rust on wheat in the South-East. With the exception of Mr. Holzgrefe, who had seen self-sown crops occasionally attacked, none of the members had any experience of this disease.

POSSIBILITIES OF THE SOUTH-EAST.—Further discussion on Professor Perkins's articles on the South-East took place. Mr. Mutton said he could not understand why it was that with farming so unprofitable as so many had stated it to be, they still practised it for a living. Mr. Pick's reply to Professor Perkins's article was also read. Members generally agreed that the Professor's estimate that 50 per cent. of the land in the South-East was fit for cultivation was considerably beyond the mark. Mr. Hart thought it would be a splendid thing if the Department of Agriculture would carry on experiments to determine how the inferior land, which constituted such a large proportion of the South-East, could be profitably utilised. The Hon. Secretary held that Professor Perkins's figures were approximately correct, and quoted numerous instances of heavy returns being obtained from wattles, potatoes, sheep, hay, onions, and fruit. He was certain that by cultivation the South-East would support a much larger population than at present.

Balaklava, June 10.

PRESENT—Messrs. Robinson (chair), Baker, Black, Neville, Spillane, Goldney, Uppill, Reuter, Kelly, Hams, and Burden (Hon. Sec.), and two visitors.

CATTLE COMPLAINT.—Mr. Spillane reported having treated with success cattle affected by this complaint. He had followed the treatment recommended by the Chief Inspector of Stock.

YELLOW PATCHES IN CROPS.—The Chairman called attention to the yellow patches in some of the wheat crops. These appeared to be worse where heavy dressings of phosphates had been applied to previous crops, and he thought it was possibly due to a deficiency in the supply of nitrogen. He intended to top-dress the patches referred to with nitrate of soda. Mr. Neville had noticed the yellow patches in his oat crops, and they were worse where the previous crop was oats. Mr. Baker had noticed the same on the sandy land, but as soon as the weather got warm the crop came along all right.

FORMALIN FOR PICKLING WHEAT.—Mr. Neville reported having pickled 20 bags of wheat with formalin. The seed had germinated very badly, while that pickled with bluestone and sown at the same time had come away well. Mr. Kelly thought that some other cause than the pickle was responsible, as he knew of a number of farmers who had used formalin with great success.

Richman's Creek, May 22.

PRESENT—Messrs. Knauerhase (chair), J. M. and H. Kelly, J. and J. S. McSkimming, Nicholson, Knox, Donovan, Wright, J. H. and F. H. Lehmann (Hon. Sec.), and nine visitors.

STALLION TAX.—Most of the members opposed the suggestion of Gawler River Branch for a tax on stallions, on the ground that it would raise the charge for service to an excessive rate. Messrs. Knox and F. Lehmann favoured a tax on travelling stallions. The latter thought if the term licence fee instead of tax were used there would be less objection to the proposal.

FEEDING POULTRY.—Members wished to know which was best food for egg-production, wheat or barley? [Mr. D. F. Laurie states that neither grain is a complete food, but wheat is the best all-round grain. If only grain is available he would advise wheat and barley fed alternately in the winter, and in the summer barley only twice a week. A variety of food is, however, essential to the best results.—Ed.]

DRILLING.—In reply to question, most of the members thought 12 acres a fair day's work for one team of horses in a drill covering 7 ft. 6 in. in width.

Kapunda, June 3.

PRESENT—Messrs. O'Sullivan (chair), W. and J. K. Shannon, Weckert, Harris, Flavel, Teagle, O'Dea, Weckert, Pascoe, Banyer, Vogt, Daly, Fawcett, and Holthouse (Hon. Sec.).

EXPORT OF PORK.—Considerable discussion on the possibilities of the export of pork took place. Correspondence was received from the Manager of the Produce Department offering to send a trial shipment to London, but stating he could give no idea of the prices likely to be realised. The Hon. Secretary said that when in Western Australia he had made enquiries, and found pigs just as cheap as in South Australia. Mr. W. M. Shannon said it was evident there was little to expect in the development of an export trade in pork at present.

STANDARD BUSHEL.—Mr. Teagle referred to proposal for a legal standard, and stated that eleven members of Parliament had promised to support the petition asking for legislation. Mr. Fawcett quoted from Aikmann's "Principles of Manuring" results of forty years' experiments with manures for wheat, carried out at Rothamsted. In these experiments the weight of the bushel varied from 57½ lb. to 60½ lb., and he thought there was a good deal in Mr. Teagle's contention for a lower standard.

Forest Range, May 25.

PRESENT—Messrs. Monks (chair), H. A. and R. Green, McLaren, Waters, Hackett, and F. Green (Hon. Sec.).

BEES.—Mr. Waters read a paper on "Bees and their Uses." The question he would like to see discussed was: "Are bees beneficial to the fruitgrower?" It was generally thought that the bees carried the pollen from flower to flower, thus assisting to fertilise the blossoms and ensure the setting of the crop. He thought that every fruitgrower would find a hive or two of bees a source of profit. He would like to know the best place to put the hives, and how high from the ground. He could not help noticing that while most people placed the hives close to or on the ground, the bees, when they get wild, build at a considerable height in trees, etc. He would also like to know the best way to keep the ants away.

Bowhill, June 10.

PRESENT—Messrs. Dohnt (chair), E. P. and A. Weyland, Fischer, Drogemuller, J. G. and H. Whitfield, Johnson, J. Waters, sen., and J. Waters, jun. (Hon. Sec.), and two visitors.

HORSES FOR FARM WORK.—Some discussion took place on the best class of horse for this district. The Chairman would put a draught mare to a good roadster stallion. Mr. Drogemuller agreed, but would not use a light stallion. The Hon. Secretary read from *Journal of Agriculture* a paper on working horses.

COMEBACK WHEAT.—Mr. E. Weyland wished to know whether this wheat would be obtainable next season through the Bureau. [Comeback wheat can be purchased in the ordinary way from Adelaide seed merchants.—Ed.]

Orroroo, June 9.

PRESENT—Messrs. Moody (chair), Lillecrapp, Brown, W. and A. Robertson, and Tapscott (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that during the past two years sixteen meetings of the Branch had been held, with an average attendance of eight members. Several papers had been read, and generally the meetings had been interesting. The retiring officers were thanked for their services, and Messrs. W. Robertson and T. H. P. Tapscott were elected Chairman and Hon. Secretary respectively.

Wilmington, June 14.

PRESENT—Messrs. Robertson (chair). Slee. Schuppan, Haunigan, Noll, Zimmermann, Bischof, McLeod, Francis, Sullivan, Maslin, and Payne (Hon. Sec.), and three visitors.

ANNUAL REPORT.—The Chairman gave an interesting review of the year's work. Ten meetings had been held, with a fair average attendance. A number of useful papers had been read, several homestead meetings arranged, and a visit and public lecture by the Dairy Instructor arranged. He was pleased that the Council of Agriculture had adopted the suggestion of the Branch for the retirement of one-third of the members annually, and trusted that the removal of the restriction as to number of members would work well.

Lyndoch, June 13.

PRESENT—Messrs. Kennedy (chair). Wolf, Rushall, P. and M. Burge, A., H., and E. Springbett (Hon. Sec.).

WHEATS.—Mr. W. Rushall read a short paper on experience with different wheats. While the old Purple Straw had given very good results in the past, he thought Marshall's No. 3 must now be placed as the best wheat for this district. He had found guano super give better results than any other manure he had tried. Mr. Wolf said he had been using manures for the past twenty-five years for his crops. First of all he used bonedust broadcast on the land, and got good and lasting results from it. Of late years various manures had been tried, but he thought mineral super had been the most profitable. As a rule he fallowed and cropped the land every second year, but on a small paddock he had grown wheat for five years in succession. For the first two years he used mineral super, the third year guano super, and the two last seasons mineral super again, and had cut good hay crops. Different paddocks responded to different manures, and they would have to find out which suited their land best. In regard to wheats, Marshall's No. 3 had done best, while Leak's was a good hay wheat. He found it beneficial to keep wheat over a season for seed, and also to secure a change occasionally. Mr. A. Springbett grew wheat on a small scale, and worked the land well. This probably accounted for the good crops he had had. For the past three years he had averaged 27 bushels per acre with Marshall's No. 3. He had experimented with mineral super and bonedust, mixed and separately, but could not see much difference in the results.

Crystal Brook, June 10.

PRESENT—Messrs. Hamlyn (chair). R. and P. Pavy, Davidson, Robinson, Hutchison, Morrish, Billingham, Solomon, Townsend, Sutcliffe, Cowled, and Symons (Hon. Sec.).

FOOD FOR STOCK.—Mr. P. Pavy read a short paper on "Cultivation and Preservation of Food for Stock." Although the mild climate of South Australia is very suitable for rearing stock, it has the disadvantage of a low rainfall and long, dry summers, which must be provided against. The most common method of doing this—especially in providing food for sheep and cattle—is to allow the grass which grows rapidly in the spring to gain on the stock, and lay in the field until required and picked up by them. This system, though inexpensive, cannot be said to be perfect. Not only does the action of the sun, weather, and trampling of stock deteriorate the grass; but the cattle naturally eat the best first, so that by the end of summer their food is very poor. How can this be improved? Much has been written and said in favour of ensilage. I have seen cattle, which had a free run of green lucerne 6 to 9 inches high, leave it for stack ensilage. The question is, "Will it pay South Australian farmers to cultivate crops for making ensilage?" A crop which would produce one ton of hay would make nearly four of ensilage. This crop, if grazed, would feed about two sheep for a year; if made into hay, about three; made into silage, eight. Reckon profit from the sheep at 10s. per head, and the silo should pay handsomely.

Arden Vale, May 22.

PRESENT—Messrs. Warren (chair), Eckert, Searle, Pearce, Fricker, Miller, Williss, Liebich, Pradel, and Hanneman (Hon. Sec.), and two visitors.

DAIRYING.—The Chairman reported on a recent visit by Mr. Suter. Mr. Eckert read a paper on "Feeding Milch Cows," which elicited a lengthy discussion. The Hon. Secretary read a paper on "Land Settlement and Water Conservation." Members thought the settlement of the outside country a risky undertaking.

Wilson, June 17.

PRESENT—Messrs. Harrison (chair), Nelson, Need, Hauesler, Rose, Connors, Beckman, Ward, Barnes, Crossman, Walkington, Sexton, Rowe, and Neal (Hon. Sec.), and one visitor.

STOCK COMPLAINTS.—Some discussion on dry bible and on horse complaints took place.

PIG-BREEDING.—In reply to question as to most profitable pig, some members advocated the purebred Berkshire, and others favoured the Berkshire-Poland-China cross.

CREAM RETURNS.—Mr. Need called attention to returns received by farmers for cream sent to the different factories. They only received payment for full pounds, and apparently all the oddments went to the factory. This might not mean much to each individual, but collectively it would represent a good deal. One member said he noticed that while his returns from a given quantity of cream were fairly regular when prices were low, such was not the case when prices rose.

Burra, June 16.

PRESENT—Messrs. Flowers (chair), Goodridge, Arnold, Needham, Duldig, Chapman, A. and J. McDonald, and Treloar (Hon. Sec.).

RABBITS.—Mr. Duldig read a paper on "Wire-netting and Rabbits." One of the principal difficulties, apart from the small rainfall, of farming in the eastern hundreds was the rabbit pest. If they got their land well cleared, they would quickly find the rabbits back again in the winter months, when they come in in thousands from the neighbouring runs. The damage they do to the crops can only be appreciated by the man who sees his wheat eaten out. To clear the land, he strongly believed in digging out all burrows and filling them in, as if the burrows are closed the dogs have more chance with any rabbits that may come in afterwards. He did not lay poison, as he considered it too dangerous to stock. However, the only real protection to the farmer against rabbits was a wirenetting fence. It would prove too expensive to each farmer to net his own land; but a good plan would be for neighbours to combine to net about 7,000 or 8,000 acres in one block. By this means the cost would be within reach, and there would be fewer gates in the netting fence. Gates are always a source of trouble, and the fewer the better. A good rabbit-proof fence could be constructed as under:—Netting to be 11- or 14-in. mesh, and 3 ft. 6 in. high; put the netting 5 in. in the ground, and above the netting have one or more barb wires, making the fence 3 ft. 6 in. or 3 ft. 9 in. The posts may be 10 ft. apart, and the netting securely fastened to each. The first plain wire should be about 6 in., the next 20 to 22 in., and the third one at the top of the netting. He mentioned that the holders of about 12,000 acres in all in this district had applied to the Government for a loan for the erection of a rabbit-proof fence round the whole area. They had agreed to be rated to pay interest and sinking fund, and this would only come to about 4d. per acre per annum. He was satisfied that this was the only way to deal with the rabbit problem in the agricultural areas.

STOCK LOSSES.—Mr. Needham reported loss of stock near Clare, through poisoning, a large patch of Cape Tulip, on the main road, being responsible. Mr. Needham was congratulated on his pending promotion to the position of Chief Inspector of Stock, although regret was expressed at the loss to the district through his removal.

Stockport, June 12.

PRESENT—Messrs. Perry (chair), Stribling, Smith, Nairn, Watts, and Murray (Hon. Sec.).

WASHING OF LAND.—Mr. Nairn read a paper on "Gutters." In this and other hilly districts there was nothing requiring more constant care and attention than these gutters. He referred not to the creeks that drain several miles of country; but to the awkward, irregular washes draining a small area. There were many paddocks that had deteriorated in value from 10s. to 20s. per acre, most of which could have been saved by a little care at the right time. They could not prevent the water running from their paddocks, and leaving its mark behind; but he had been frequently struck by the big gutters caused by a little water. In his opinion, the water, unaided by the summer heat, would not cause much damage; but the sun bakes and cracks the clay soil, leaving it at the mercy of every summer shower and the early winter rains. If the edges of these gutters were sloped, so that they could be crossed by the plough and other cultivating implements, grass would soon grow in the gutters, and, if taken early, the land would hold. Straw, bushes, etc., were useful to assist in filling up these gutters; but the best plan was to get something to grow there. The star thistle was a noxious weed, and the landholder was compelled to destroy them; but there was nothing better for catching the silt. He would advise farmers to leave the thistles in the gutters. Stable manure was very useful along the smaller gutters, as it assisted to hold the silt, and ensured a growth of grass, even on the hungry clay land. Mr. Smith found it did not answer to level down the sides of gutters. With large washes he found it best to put in breaks. Mr. Watts thought it better to let the land lie out to grass for three or four years after cropping. Artichokes and flags (iris) were useful for holding the soil in watercourses and creeks.

Arthurton, June 15.

PRESENT—Messrs. Hawke (chair), Short, Welch, Rowe, T. and S. T. Lamshed, Stephenson, Lomman, and Palm (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at Mr. J. Welch's homestead. This is a large, well-managed farm, and, as Mr. Welch is a handy man, members spent a very interesting time.

Mount Pleasant, June 9.

PRESENT—Messrs. Phillis (chair), Drogemuller, P. and J. F. Miller, Royal, Maxwell, Tabscott, and Vigar (Hon. Sec.).

FOXES.—Considerable discussion took place on damage done by foxes in this district. Wild dogs were reported to be destroying sheep and lambs on the Murray Flats.

Denial Bay, June 3.

PRESENT—Messrs. Smith (chair), Hasting, Hoffrichter, Croker, Meier, Starling, Gale (Hon. Sec.), and one visitor.

CATTLE COMPLAINT.—Mr. Starling initiated discussion on losses of cattle. He had lost five head recently, and on opening them he could find nothing to indicate the cause of death. They had plenty of good green feed and water. Mr. Hoffrichter had lost three head, and a neighbour the same number. In most cases a running discharge from the mouth took place just prior to death. He estimated the losses in this district during the present year at fully 100 head. Mr. McKenzie reported having lost several animals. It was resolved that, in the opinion of this Branch, in view of the heavy losses of cattle from unknown diseases, the Government should take steps to have a searching investigation made into the nature and cause of these losses. [Arrangements have been made for Veterinary Surgeon Desmond to take up this work.—Ed.]

Minlaton, June 10.

PRESENT—Messrs. H. W. Martin (chair), Mayer, Parsons, Correll, Boundedy, J. Martin, A. and J. McKenzie (Hon. Sec.), Veterinary Surgeon Desmond, and a number of visitors.

QUESTION BOX.—A number of questions were asked through the box. Members were of opinion that, under present conditions, a high f.a.q. standard for wheat was of no benefit to the farmer. None of the members were prepared to answer the question, "Is a dressing of 70 lb. of super as good for the one crop as a dressing of 100 lb.?" In reply to question as to cost of growing wheat, members were of opinion that it all depended upon the farm and the farmer. Most of them thought that a bushel of seed per acre would not be too much to sow if every grain could be depended upon to grow.

TREE PLANTING.—Members agreed with paper read at previous meeting advocating the planting of trees, though some had not been successful in their efforts in this direction. It was decided to try to secure some seeds of sugar gum, in order to raise the plants in the locality.

THE HORSE AND ITS AILMENTS.—Veterinary Surgeon Desmond gave a very interesting address on this subject. Numerous questions were asked and answered, and a hearty vote of thanks was accorded to Mr. Desmond for his address.

Sutherlands, June 14.

PRESENT—Messrs. Twartz (chair), C. A. E. and A. Schiller, Kernich, Nitschke, Hameister, Thiele, Heinrich, and Dart (Hon. Sec.), and three visitors.

WEEDS.—Mr. C. A. E. Schiller read a short paper on this subject. Weeds were plants out of place; any plant, no matter how valuable elsewhere, was a weed when it grew in the cereal crop. The term noxious weed should be applied only to such plants as were useless for fodder. In this district there were many weeds, and the farmer was kept busy most of the year in his efforts to clean the land. Charlock, or wild mustard, gives a lot of trouble. Barley grass, though good for pasture, was very objectionable in the wheat crops. The ripe seedheads were also a source of trouble, causing sore mouth in stock. The ice plant (*Mesembryanthemum*) was one of the worst weeds they had to contend with. It was well known in various parts of the North, and had existed in this district as long as any of the farmers could remember, though it is only during the past eight or ten years that it had become such a nuisance. The loose mallee lands seem to be very congenial to the plant, which often takes complete possession of the ground. In his opinion, the best way to get rid of this weed was to fallow the land as soon as the young plants appear, and to keep the fallow clean by frequent working with scarifier and harrows. The stemless horsethistle was another noxious weed which had made its appearance in this district, and every effort should be made to eradicate it before it spreads. Mr. Schiller read article by Mr. W. L. Summers, from *Journal of Agriculture*, on the ice plant. Considerable discussion followed. The Chairman thought ploughing the young plants under would eradicate the ice plant. Mr. Kernich had tried burning the stubble on infested land, and several other members supported this method of destroying the weed.

POULTRY.—Some discussion on best laying breed of fowls took place, the White Leghorn being generally favoured.

Dawson, June 17.

PRESENT—Messrs. Renton (chair), A. H. and C. Warner, Drayson, Collins, Kilderry, Meyers, Severin, and Just (Hon. Sec.)

CULTIVATION.—Considerable discussion took place on the question of scarifying land for the wheat crop instead of ploughing it. None of the members had used the scarifier in place of the plough, but several expressed their intention of treating a small area in this way as an experiment. Mr. Collins said he found it best to fallow with the plough early in the season, and cultivate to a fine tilth while the land was wet. Then, at seedtime, very little would require to be done to prepare the land for the seed.

Mount Gambier, June 10.

PRESENT—Messrs. Edwards (chair), Wedd, Mitchell, Dow, Buck, Schlegel, Williams, Wilson, Pick, Watson, Smith, Sassanowsky, Ruwoldt, Barrows, and Collins (Hon. Sec.).

NITROGEN-GATHERING BACTERIA.—The Hon. Secretary reported on visit by Inspector of Fertilisers to supervise sowing of red clover on experimental plots. Owing to the wet weather, this work could not be completed. Mr. Smith stated that he had been compelled to broadcast the seed on the plots, as the land was too wet for drilling. He was carrying out some experiments with crimson clover, for comparison with the red clover.

ROTATION OF CROPS.—The Chairman initiated a discussion on this subject. The system he adopted was as follows:—After grass he grew potatoes, then wheat (which usually yielded well), then barley, and, after that, oats. The land was then laid down to grass for two or three years, and did well. The only manure the land received was that made on the farm, and this was applied to the grass or ploughed under, and the field left out to grass. He found stock did better on the grass or land that was cultivated at intervals. He found oats the only cereal crop that would do after barley. Mr. Barrows said he found he could not grow much in rotation. He usually put in oats on breaking up the grass land; then a crop of wheat, which was sometimes followed by barley. He then sowed the land down to grass, and left it for three or four years. He had not found any benefit from the application of manure; but lime had a good effect on his land. Mr. Ruwoldt said his rotation and experience were practically the same as that of the Chairman. Mr. Sassanowsky said they followed grass with potatoes, then wheat, and then barley. After barley they sowed the land down with rye grass, and left it for two years. They had used different manures, and, although the plant showed the effect for a time, there was little difference at harvest. He thought this due to the land being very weedy.

LIME.—Mr. Mitchell thought lime was not used as freely as it should be on the land. Several members agreed, and some discussion took place on the question as to whether the lime should be applied prior to or at seedtime.

PICKLING SEED WHEAT.—Mr. Ruwoldt said he used 8 ozs. of bluestone dissolved in 2 galls. of water for pickling 4 bushels of wheat, sprinkling the wheat on the floor. Mr. Sassanowsky used 1 lb. bluestone dissolved in 8 galls. of water, and dipped the seed in it.

AMERICAN GIANT CLOVER AND "PASPALUM DILATATUM".—Mr. Williams distributed among the members packets of seed of American Giant Clover, given by Mr. Alex. Robertson, of Struan, who had grown this with considerable success. *Paspalum dilatatum* was also growing well on a part of Struan, and should receive more attention than it did on the poor lands in this district. Mr. Collins said his late father sowed a plot of *Paspalum dilatatum* in the garden. It took very well, and it was transplanted into a small paddock, and it spread over the whole paddock, and made a permanent pasture of good grass.

A CALF DISEASE.—Mr. Williams brought under notice a calf disease that was causing trouble in the district. Some people had lost a number of calves by it. The symptoms were these:—Calves from four to eight weeks old were attacked. They refused their food; they looked languid; their eyes watered; their ears drooped; laceration and scab appeared upon the nose and butts of the ears. Small pimples formed, and drops of blood issued from them. Pimples formed along the spine also. In a few days the calf got down, and was unable to rise. In a *post-mortem* he made he found the lungs wholly diseased, a mass of ulceration, with adhesion to the ribs; ulceration of the throat and the root of the tongue; the liver a mass of necrosed tissue with pus and inflammation extending down into the umbilical cord. The intestines were ulcerated, and had adhesions to the peritoneal wall, and the intestines to each other. Investigations had been made in Victoria as to the nature of the disease, and the experts spoke of it as pneumonia enteritis, and Dr. Bull said it was caused by one or more micro-organisms, and was a contagious disease. They directed that calves should not be allowed to lie in dirty conditions. His (Mr. Williams') own idea from the *post-mortem* was that the inoculation with the disease took place at the navel, and passed thence into the liver and the lungs, and then into the intestines. At any rate, it behoved them to look, and when any calves were taken from the mother they should be put in clean surroundings, and if it was an infectious disease there was no doubt it would be wise to isolate

the sick ones. If any more cases occurred in the district, he would like them reported to him, so that he could make further investigations.

FOOTROT.—Mr. Collins said that since he received the pamphlet on footrot from Mr. Clarke he had tried the carbolic acid cure on a ram that had been lame for years, that could not rise from his knees. He applied it three different times, and to-day the ram was as sound in his feet as any in the paddock. Mr. Williams reported the cure of a large tumor on a cow's jaw by the use of carbolic acid. The tumor was cut, a great deal of matter issued from it, and then the wound was filled up with a strong solution of carbolic acid, and in three weeks the cow was cured.

Penola, June 10.

PRESENT—Messrs. Ricketts (chair), Stoney, Kilsby, McBain, and Peake (Hon. Sec.).

CALE.—Considerable discussion took place on paper read at a previous meeting by Mr. Kilsby, who stated that he sowed 1 lb. of seed per acre, and not 4 lb.

MANURES FOR ONIONS.—Considerable discussion took place on the use of fertilisers, and the Chairman asked what manures should be used for onions. [Will some of our onion-growers give their experience on this subject. A reliable American authority says plenty of old rotted farmyard manure is unequalled for onions. It must be well rotted, and be ploughed under and thoroughly mixed with the soil. After the manure a ton or two of wood ashes can be applied with advantage. Failing this, some form of potash is necessary. Nitrate of soda is applied several times as a top-dressing at rate of 75 lb. per acre while the plants are growing, or, in lieu thereof, one application of about 2 cwt. of sulphate of ammonia shortly after the plants are set out. This is liberal manuring; but the yield is expected to be heavy.—Ed.]

Mount Remarkable, June 15.

PRESENT—Messrs. Casley (chair), Challenger, W. J. and F. F. Smith, Karger, Yates, McIntosh, Ey, and O'Connell (Hon. Sec.).

GRASS FOR HEAVY LAND.—The Hon. Secretary wished to know best grass for lawn on heavy Bay of Biscay land. Most of the members thought couch grass best, but would like the opinion of the Editor. [If for ornament only probably "buffalo" grass would do best in this locality, but for a playing ground "couch" grass is superior.—Ed.]

FALLOWING AND FERTILISERS.—Mr. W. J. Smith read a paper on this subject, and good discussion ensued.

Wepowie, June 13.

PRESENT—Messrs. Orrock (chair), Crocker, Roberts, Chrystall, and Halliday (Hon. Sec.), and six visitors.

ANNUAL REPORT.—The Hon. Secretary's report showed an average attendance of over eight members, besides several visitors. Five papers had been read and discussed. Messrs. C. Halliday, P. MacNamara, and J. Orrock were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

FARMING.—Mr. J. Crocker read a paper on the most profitable way to work a farm in this district. A farm of at least 1,000 acres was necessary, as anything less was insufficient to make a reasonable living in this district. The first thing to do was to erect a ring fence, sheep-proof in character, then sub-divide the farm as funds permit, fencing always being a large item of expense. Eight good working horses were required; one should be a brood mare, as it paid to have a few young horses coming on. A useful buggy- or saddle-horse was necessary; but care should be taken not to encumber the farm with idle or unnecessary animals. Two or three cows should be kept, and these must be handfed. A few Merino ewes, say 150, should be kept, and he would mate these with good Merino rams, so that they could always pick out a few good young ewes to replace the old ones. In this district seeding should be started in April. He would drill about 1½ in. deep, and fix a light harrow behind the drill. The drill should follow as closely as possible behind the cultivator, as the seed germinated better

than if the soil is exposed to the drying influence of the wind for a few days before the seed is drilled in. A combined cultivator and drill, which could be drawn by six horses, would be very useful. In sowing he would allow 50 lb. per acre of Purple Straw wheat, and 60 lb. of the earlier-maturing wheats; 50 lb. of manure per acre was sufficient. Seed wheat should be thoroughly cleaned and pickled, using $\frac{1}{2}$ lb. of bluestone to the bag of Purple Straw wheat, and $\frac{3}{4}$ lb. to the bag with early wheats. Fallowing should be started as early as possible after seeding is finished. He thought it would be a good idea to fallow 100 to 150 acres in February or March, when possible, as the team was not busy then, and the weeds would start earlier on this land, thus providing earlier feed for sheep. Twenty to 30 acres of the best of the crop should be cut for hay. Cut the crop when in full bloom. All wheaten chaff and straw should be saved. Considerable discussion ensued, most members agreeing with the paper.

Koolunga, June 15.

PRESENT—Messrs. Sandow (chair), Button, Jose, Hutcheson, Cooper, Palmer, Butterfield, Perrin, and Neack (Hon. Sec.).

SHOEING HORSES.—At previous meeting Mr. R. Lawry read a paper on this subject to the following effect:—In order to understand the general principles of shoeing, one must have a thorough knowledge of the horse's foot, as no hard-and-fast rules can be laid down as to the best and correct method of shoeing. Some horseowners will ask farriers to pare down the feet well, which, if often done, means ruination to the horse for a time. Before cutting down the foot, careful inspection is necessary on the part of the farrier, as some horses carry more hoof than others. The fore feet are of more importance than the hind ones in the matter of shoeing, as they have to support more weight, and are consequently more exposed to disease and injury. With all his experience in shoeing, he had scarcely seen a horse with what might be called bad hind feet, unless from some accident, whereas too often the contrary is the case with the fore feet, and this mainly through bad shoeing. In reducing the hoof to its proper length great care should be exercised in keeping both sides of the hoof the same height, as if one side should be left higher than the other the foot, fetlock, and the whole limb are thrown out of perpendicular. This causes the horse to travel painfully, and it twists and jars the leg and in time leads to disease. In most cases the inside of the foot is left higher than the outside; this throws an undue strain on the outside of the fetlock. The wall should be reduced as level as possible, leaving the sole and frog as nearly natural as possible. He believed in trimming off the ragged edges of the frog, also the loose parts of the sole of the foot; but nothing more. The bars should be left intact, except when corns are present, when the bar must be removed to ease the corns. Corns are too often caused by badly-fitted shoes, though this was not always the farrier's fault. Often the horse is left too long without shoes, and it is impossible to get a good bed for the shoe. The shoes, then, should be made to fit well round on the wall of the foot from quarter to quarter, leaving the heel with rather more than daylight between the foot and the shoe. Some people say that the foot should never be rasped on the outside; but this is a matter of impossibility, more especially with horses that are not frequently shod, as the hoof grows outward as well as down, and it has at times to be cut back. He did not believe in rasping above the nails, as it allows the moisture to escape from the hoof. Rasping below the nails cannot be done away with. A few of the evils too often practised in shoeing are paring the sole and the frog too much; using too heavy shoes and faulty shapes; using too many and too large nails; applying too small a shoe and too short, and rasping the hoof to suit the shoe; rasping above the nails in front of the hoof. The man who follows Nature the closest is the one who will come out best in the end. In preparing the foot the treatment must vary according to the shape of the foot. Some horses have strong feet and high heels, while others never require to have their heels touched. A flat foot requires more protection to the heel and frog than the strong foot does. A well-formed fore foot should be nearly round, with thick crusts, and was no trouble to shoe. In shoeing light horses he found the best way was to hollow the shoe well, fit it well from quarter to quarter, giving it a good spring at the heels, with plenty of room at the heels; also to keep the heels as long as the hoof will allow, as a short shoe causes too much strain on the back sinews of the leg. Use six or seven nails in each shoe.

When a horse cuts badly behind, the best method is to cut the outside of the hoof well down, leaving the inside highest: also to thicken and narrow the shoe on the inside from toe to heels, turning it well under, and leaving the foot in its natural state, with the exception of rounding off the edges underneath. Put only two nails on the inside of the toe of the shoe. He believed in wide heels generally, as to put on narrow heels and quarters it is too often the case that the heels are rasped away on the outside of the hoof, which weakens the foot, and causes the horse to go pigeon-toed and often lame. In shoeing draught horses it was necessary to keep the shoes close in at the heels, as otherwise, when working together, one may tread on the other's shoes and pull them off.

FARMING, AND HOW TO MAKE IT PAY.—Mr. W. T. Cooper read a paper on this subject. It behooved the farmer to do his best to make his land produce to its utmost capacity. One of the leading factors in this was good cultivation, and he gave special prominence to early fallowing. He strongly advised starting the plough as soon as the crop was in, so that all the winter rains may penetrate the soil. He would plough fairly deep—not less than 4 in., and, when the land permitted, up to 6 in. In no case should the land be ploughed when really wet and boggy, as the soil in many instances will set very hard. He would harrow with heavy harrows after ploughing, and then scarify or cultivate fairly deeply as often as was necessary. Besides securing a good tilth, their object was to destroy as many weeds as possible. Where summer weeds, such as stinkwort, star thistle, and potato weed, were bad, a late scarifying will prove invaluable, as these plants do not start to grow until the ground begins to get warm. Harrow after this last scarifying, and then, under ordinary circumstances, no further work is necessary until seed time. Before drilling in the seed, cultivate to a fair depth. Sow early, and put the seed about 2 in. deep, as there was more moisture there, and consequently less risk of malting than when seed is sown shallow. In all cases, if possible, harrow well after the drill, as this practice has many advantages. It will destroy a lot of young weeds, secures a good tilth, thus assisting to conserve moisture, covers many seeds in the hollows or furrows and levels the ground. The latter point is important, as on uneven ground there is more wear on the stripper, and, owing to the jolting, a lot of wheat is shaken off the comb on to the ground. Where the land is free from weed, and works well, sowing should be finished in this district not later than the end of May. Grade the seed, and sow the slower-growing wheats first. He advised sowing mostly of good rust-resisting wheats, such as Gluyas, Carmichael's, Eclipse, and Marshall's No. 3. These are all good yielders, and in a rusty year will fill the bag with plump grain when the softer varieties are shrivelled. In dealing with the growing of wheat the farmer must never lose sight of the fact that one of the main objects in the preparation of the land is the conservation of moisture. A few sheep should be kept by the farmer, as they assist to keep down the weeds, reduce the butcher's bill, and bring in revenue for wool and lambs. Two-thirds of the sheep should be good young Merinos, the balance wethers for killing. For lambs, the large-framed Merino ewe, mated with a good Shropshire ram, gives very satisfactory results. If well fed, the lambs at five or six months will sell at 12s. 6d. per head, and the ewes should cut 6s. worth of wool. Overstocking must be avoided. The above returns can only be secured where there is plenty of food. All implements should be housed when not in use: care and good housing add years of life to farm implements. All implements should be kept well painted, and any breakage repaired at once, and not left until absolutely needed to keep the implement working. Farmers should not forget that the neglect to repair a small defect may cause more serious damage. The harness should be kept well oiled: a few shillings spent on neatsfoot oil is money well spent. The paper was well discussed. Mr. Button disagreed with the writer on the question of deep ploughing, as he had known many paddocks spoiled through this cause.

Cherry Gardens, June 13.

PRESENT—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Broadbent, Hicks, Curnow, Burnee Brumby, and Ricks (Hon Sec), and two visitors.

LOCAL NOTES.—Considerable discussion on matters of local interest took place.

WINTER DWINDLING OF BEES.—Mr. S. H. Curnow read a very interesting paper on this subject. [This is published in another part of this issue.—Ed.]

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